DOCUMENT RESUME

ED 152 232 IR 005 546

AUTHOR Kirk, Thomas
TITLE The Development of Course Related Library and Literature Use Instruction in Undergraduate Science Programs. Vol. III.
INSTITUTION Earlham Coll., Richmond, Ind.
SPONS AGENCY National Science Foundation, Washington, D.C. Div. of Science Information.
PUB DATE Sep 77
GRANT DSI 76-10129
NOTE 93p.; For related documents, see IR 005 544-545 and IR 005 547 ; Best copy available

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS Annual Reports; College Libraries; *Instructional Materials; *Library Instruction; *Program Descriptions; *Program Evaluation; Projects; *Science Education; Science Programs; Undergraduate Study; University Libraries; *Workshops

ABSTRACT

This project was funded by the National Science Foundation to help institutions of higher education develop course-related library instruction programs for students in undergraduate science programs. The third volume of the annual report for 1976-77 continues with appendix four, i.e., the texts of documents referred to in the proceedings of the October 1976 workshop. These documents include chemistry library exercises, scientific communication project, biology quiz, bibliography evaluation form, library user opinion scale and results, and bound periodical use survey results. Also in this volume are appendices five through nine, which include the participant evaluation of the October 1976 workshop, consultants' reports for the workshop, the May 1977 evaluation of the project, guidelines for reports on activities, and the May 1977 workshop schedule. (Author/KP)

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ED152232

VOLUME III

The Development of Course Related Library and Literature Use Instruction in Undergraduate Science Programs

(NSF Grant DSI 76-10129)

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Annual Report

June 22, 1976 - July 1, 1977

by

Thomas Kirk

Project Director

September, 1977

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IR005546

CHEMISTRY 13: LIBRARY EXERCISE II

April 1975

This exercise is designed to illustrate how Science Citation Index and Chemical Abstracts can be used in an author approach to a topic on which you are working. You should complete the steps outlined below and submit to the Science Library your answer sheet only. It will be checked and you will be informed whether the exercise has been completed satisfactorily or unsatisfactorily.

Science Citation Index

1. Read carefully the attached sheet which describes the use of the SCI. The power of SCI rests in its simplicity. Using a reference (bibliographic identification of a journal article or book) one can quickly find out if new papers on the topic of the original article have appeared by checking to see if anyone has cited that reference.

2. Below is a list of citations which have been taken from Krauch, Organic Name Reactions. Each citation was the first, or at least an early article that describes an organic reaction which is now named after the chemist who described it. Following each citation two different years are listed. You are to look in the Science Citation Index "Citation Index" for those two years and write down on your answer sheet the complete citation for the first reference that cited your reference (the reference which you are to use is the one that has the number matching the number in the upper right corner of the front page of these directions).

From Krauch, Organic Name Reactions (Sci/Ref/QD/291/K7.13/1964)

1. p. 4 Adkins, H. and Peterson, W. R. J. Am. Chem. Soc. 53, 1512 (1931).
   1964 1965

2. p. 16 Appel, H. and Robinson, R. J. Chem. Soc. 1935, 426.
   1966 1970

3. p. 29 Baker, J. W. and Nathan, W. S. J. Chem. Soc. 1935, 1844.
   1964 1965

4. p. 34 Bardhan, J. C. and Sengupta, S. C. J. Chem. Soc. 1932, 2520.
   1967 1968

5. p. 44 Lapworth, A. J. Chem. Soc. 83, 995 (1903).
   1965 1966

6. p. 47 Bergmann, M. Science 79, 439 (1934).
   1965 1969

7. p. 118 Davidson, D., Weiss, M. and Jelling, M. J. Org. Chem. 2, 328 (1937).
   1966 1957

8. p. 73 Brown, H. C. and Zweifel, G. J. Am. Chem. Soc. 81, 247 (1959).
   1964 1965

9. p. 82 Calvin, M., Bassham, I. A. and Benson, A. A. Federation Proc. 9,524 (1950).
   1964 1956

10. p. 86 Carroll, M. F. J. Chem. Soc. 1940, 704.
    1964 1966

11. p. 97 Clay, J. P. J. Org. Chem. 16, 892 (1951).
1964 1965

12. p. 133 Cope, A. C. and Hardy, E. M. J. Am. Chem. Soc. 62, 441 (1940).
1964 1965

13. p. 105 Cram, D. J. and Elhafez, F. A. A. J. Am. Chem. Soc. 74, 5828 (1952).
1964 1965

14. p. 112 Dakin, H. D. J. Biol. Chem. 44, 499 (1920).
1964 1972

15. p. 115 Dakin, H. D. and West, R. J. Biol. Chem. 78, 91 (1928).
1964 1965

16. p. 137 Duff, J. C. J. Chem. Soc. 1941, 547.
1964 1965

17. p. 193 Gomberg, M. and Pernert, J. C. J. Am. Chem. Soc. 48, 1372 (1926).
1964 1965

18. p. 193 Gomberg, M. and Bachmann, W. E. J. Am. Chem. Soc. 46, 2339 (1924).
1964 1965

19. p. 215 Haworth, R. D. J. Chem. Soc. 1932, 2717.
1964 1968

20. p. 65 Swallen, L. C. and Boord, C. E. J. Am. Chem. Soc. 52, 651 (1930).
1964 1965

21. p. 166 Forster, M. O. J. Chem. Soc. 107, 260 (1915).
1965 1967

22. p. 216 Haworth, W. N. J. Chem.Soc. 107, 13 (1915).
1965 1967

23. p. 244 Levene, P. A. J. Biol. Chem. 23, 143 (1915).
1964 1965

24. p. 239 Hooker, S. C. J. Am. Chem. Soc. 58, 1174 (1936).
1966 1970

25. p. 239 Hooker, S. C. J. Am. Chem. Soc. 58, 1179 (1936).
1966 1968

26. p. 308 Mattox, V. R. and Kendall, E. C. J. Biol. Chem. 188, 287 (1951).
1966 1967

27. p. 392 Robinson, R. J. Chem. Soc. 95, 2167 (1909).
1967 1968

28. p. 138 Dutt, P. K., Whitehead, H. R. and Wormall, A. J. Chem. Soc. 119, 2088(1921).
1970 1971

29. p. 138 Dutt, P. K. J. Chem. Soc. 125, 1463 (1924).
1970 1971

30. p. 449 Baron, H., Remfry, F. G. P. and Thorpe, J. F. J. Chem. Soc. 85,1726(1904).
1968 1970

31. p. 137 Duff, J. C. and Bills, E. J. J. Chem. Soc. 1932, 1987.
1967 1969

32. p. 242 Hudson, C. S. Scientific Pap. Bur. Stand. No. 533, 241 (1926).
1968 1969

33. p. 63 Bogert, M. T. Science 77, 289 (1933).
1967 1971

34. p. 104 Craig, L. C. J. Am. Chem. Soc. 56, 231 (1934).
1965 1966

35. p. 99 Clemo, G. R. and Leitch, G. C. J. Chem. Soc. 1928, 1811.
1968 1969

36. p. 194 Gould, R. G. and Jacobs, W. A. J. Am. Chem. Soc. 61, 2890 (1939).
1969 1970

3. Now that you have located articles that have cited your original reference, find the titles for the two references you wrote down above. Write the complete titles as given in the "Source Index" of SCI.

Chemical Abstracts

1. Read carefully the description of the author indexes to Chemical Abstracts.

2. For the purposes of this exercise, suppose the library does not have the journals that contain the two references you listed in answer to questions 2 and 3 above. Find an abstract of these articles by searching the author indexes to CA. On the answer sheet list the volume and abstract numbers for the two references.

CHEMISTRY 13

Library Exercise II: Answer Sheet

April 1975

Name _____ P.O.Box _____

Your problem #: _____

Science Citation Index

2. Reference searched: _____
(Number) (Author) (Citation)

Year of SCI searched: _____

Articles located: (1) _____

Year of SCI searched: _____

Articles located: (2) _____

3. The author(s) and title of reference (1) above are: _____

_____

_____

The author(s) and title of reference (2) above are: _____

_____

_____

Chemical Abstracts

2. The Chemical Abstracts volume and abstract number for the two references above are: (e.g. CA 45:3456g)

(1) CA____:_____

(2) CA____:_____

WHEN YOU HAVE FINISHED TURN IN THIS ANSWER SHEET AT THE WILDMAN SCIENCE LIBRARY CIRCULATION DESK. KEEP THE DESCRIPTIONS OF SCI AND THE CA AUTHOR INDICES FOR FUTURE USE

Name _____

Box # _____

Chemistry 13: Library Exercise I

ORGANIZATION OF ORGANIC COMPOUNDS IN TABLES AND INDEXES

May 1976

Exercise Ic

The reference works you have used so far in exercise 1 a& b are arranged by formulas or names of organic compounds. In this exercise you will use lists of compounds that are arranged by class of compound and/or chemical property. This arrangement is useful in situations where you are trying to identify an unknown compound. Usually when unknowns are being identified initial tests are performed to determine the class of compounds to which the unknown belongs. Then through further tests and synthesis the particular compound of that class is identified.

In order to answer the following questions you will need to read the following information on each of the two tools you will be using.

Huntress, Ernest H. and Samuel P. Mulliken. Identification of Pure Organic Compounds. 1941. Sci/Ref/QD/291/H8

"This volume presents in organized and accessible form a summary of data on a selected list of organic compounds containing carbon and hydrogen, or carbon, hydrogen, and oxygen." It is arranged by classes of compounds and then by increasing melting or boiling point. The volume begins with approximately twenty-five pages of explanatory material, including abbreviations, a description of the arrangement, and notes on the parts of each entry. That information is summarized below. The organization of the volume is as follows:

Order I: Suborder I
  Genus 1. Aldehydes
    Division A. Solids
    Division B. Liquids
  Genus 2. Carbohydrates
    Division A. Solids
      Section 1
        Subsection A
        Subsection B
        Subsection C
      Section 2

Genus 3. Acids
  Division A. Solids
    Section 1. "Soluble"
    Section 2. "Insoluble"
  Division B. Liquids
    Section 1. "Soluble"
    Section 2. "Insoluble"
Genus 4. Phenolic compounds
  Division A. Solids
  Division B. Liquids
Genus 5. Esters
  Division A. Solids
  Division B. Liquids
Genus 6. Anhydrides, lactones, etc.
  Division A. Solids
  Division B. Liquids
Genus 7. Ketones
  Division A. Solids
  Division B. Liquids
Genus 8. Alcohols
  Division A. Solids
    Section 1. "Soluble"
    Section 2. "Insoluble"
  Division B. Liquids
    Section 1. $D_4^{20} < 0.90$
    Section 2. $D_4^{20} > 0.90$
Genus 9. Hydrocarbons, ethers, etc.
  Division A. Solids
    Section 1. "Non-aromatics"
    Section 2. "Aromatics"
  Division B. Liquids
    Section 1. "Aromatics"
    Section 2. Acyclic ethers
    Section 3. Dienes, alkynes, cyclenes, tarpenes, etc.
    Section 4. Alkenes
    Section 5. Naphthenes
    Section 6. Alkanes

Order I: Suborder II
  Division A. Solids
  Division B. Liquids

Following is an entry with each part marked:

1 | 2 | 3

1:0155 *n*-VALERALDEHYDE *n*-C_4H_9CHO $C_5H_{10}O$ Beil. I-670

4 | B.P. 103.7° (1) M.P. −91.5° (1) D_4^{20} = 0.80052 (2) n_D^{20} = 1.39136 (2)

5 | Mobile liq. with penetrating odor. Dif. sol. aq. With aq. ferric chlor. bluish. mist. (b.p. 90.6° at 747 mm.) contg. 50% vol. % C (2).
With mdet. aq. $NaHSO_3$ soln. yields dif. sol. bisulfite addn. cpd. [cf. T 1.12].

6 | P Sodium nitroprusside color test: Aq. susp. of C, treated with 0.5% sodium nitroprusside soln. + alkali gives violet-red color, grad. disappearing on addn. of AcOH [dif. from isovaleraldehyde (1:0140)].

7 | D *n*-Valeraldoxime: Aq. soln. of C, shaken with $NH_2OH.HCl + K_2CO_3$, readily yields oxime; after recrystn. from pet. ether, m.p. 52° (3).
D *n*-Valeraldehyde 2,4-dinitrophenylhydrazone: yel. cryst. from alc., m.p. 98° (4); 106.5–107°7 (5) [cf. T 1.14].
D *n*-Valeraldehyde dimethone: m.p. 104.5° (6).

8 | 1:0155 (1) Simon, *Bull. soc. chim. Belg.* **38**, 56 (1929). (2) Brayland, Ercould, *Bull. acad. roy. Belg.* (5) **17**, 1174-1179 (1931); *Chem. Abs.* **26**, 3232 (1932). (3) Blaise, *Bull. soc. chim.* (3) **31**, 491 (1904). (4) Allen, *J. Am. Chem. Soc.* **52**, 2957 (1930). (5) Backer, Haack, *Rec. trav. chim.* **57**, 232 (1938). (6) Kao, Yen, *Science Repts. Natl. Tsing Hua Univ.*, Ser. A-1, 157 (1932).

1. Entry number
2. Name, structure, formula
3. Beilstein Handbuch den Organischen Chemie reference
4. Melting point, and other properties
5. General information on properties and reactions
6. P = Preliminary test, specific or semi-specific color tests which are generally easy to execute.
7. D = Derivative; recommended derivatives
8. Literature references which are the sources of information in the first seven sections

Rapport, Zvi. Handbook of Tables for Organic Compound Identification. 3rd ed. 1967. Sci/Ref/QD/291/R2.8/1967

Like Huntress and Mulliken, this Handbook arranges organic compounds by chemical class and by melting point or boiling point. However, the information provided, which is less detailed for particular compounds, is in tabular form. Generally speaking, but not always, each table lists a class of compounds, similar to those from H & M, and for each compound one or two properties are given. Then for each compound, a series of known derivatives are indicated with a melting point, and other data. For each table there is a

prefatory discussion which explains the tables and gives the references from which the information was taken.

While H.& M and this Handbook serve very similar purposes, each has a slightly different but complementary use. H & M provides more information on individual compounds, especially references to specific literature sources, while there are, on the whole, fewer derivatives for each compound. The Handbook, because of its arrangement, makes it possible very quickly to determine what derivatives are possible and which ones are going to provide the critical data needed to determine your unknown. However, it will not give the references to procedures and other specific information in as convenient a manner as H & M.

In summary, use them in combination.

Using the two tools, provide an answer to each of the following questions:

1. You have a carboxylic acid that is solid at room temperature and melts at 100° C. Is that temperature sufficiently unique to identify the acid?

   Yes No

   a. If yes, what is the compound? _____

   b. If no, how many different compounds will you have to distinguish among in further tests? _____

2. You have an alkene that has a boiling point of 66-67° C.

   a. What alkene(s) could it be? _____

   _____

   b. If you did a bromine addition reaction synthesis on your alkene, and then found the product to have a <u>boiling point</u> of 72° C, what compound(s) could your unknown be? _____

   _____

3. What is the <u>Beilstein</u> reference for a liquid phenol with a boiling point of 267.5° C? _____

4. You have a carboxylic acid with a melting point of 219°.

   a. Which acids could it be? _____

   _____

   b. Which derivative(s) of the acids will provide data to distinguish what your unknown is? _____

   _____

5. You have an unknown alcohol with a boiling point of 65° C.

   a. What preliminary test might you use to determine if it is in fact methyl alcohol? _____

   _____

b. What article provides procedures for producing methyl p-nitrobenzoate, a derivative of methyl alcohol?

(author) (journal title) (vol#,page) (year)

c. Do we have this reference?

Name _____

Box # _____

Chemistry 13: Library Exercise I

ORGANIZATION OF ORGANIC COMPOUNDS
IN TABLES AND INDEXES

May 1975

Exercise Ia

This exercise deals specifically with the Chemical Rubber Company's Handbook of Chemistry and Physics (Sci/Ref/QD/65/H3 (on reserve)) and the Lange Handbook of Chemistry (Sci/Ref/QD/65/H3.2/rev. 10th ed.:1967 and 11th ed.:1973 (on reserve)). But because these two reference works represent the two ways in which most tables and indexes of organic compounds are arranged, they will illustrate the problems the user of reference books on organic compounds will face.

The introductions to the tables in the handbooks* will provide you with the information needed to work through this exercise. These pages are summarized here:

Both handbooks contain a long table listing physical properties of organic compounds. In addition to the table, there are formula indices and melting point indices. Both handbooks provide essentially the same types of information for each compound:

1. name
2. synonyms
3. formula
4. reference to Beilstein (a compendium of synthesis and other data on organic compounds)
5. molecular weight
6. crystalline form and color
7. specific gravity
8. melting point
9. boiling point
10. solubility in water, alcohol and ether

In addition, CRC gives refractive index for light of the D line of the sodium spectra, solubility in a greater number of solvents, and the references may be to publications other than Beilstein.

In the tables the compounds are arranged differently. In Lange, the compounds are arranged by name in an uninverted form (i.e., dimethyl ketone is in the d's). In many cases common or non-official names are used (e.g., Benzylamine instead of Amino-toluene). CRC handbooks are just the opposite. Official names are almost always used (except for biochemicals which would be cumbersome to list if the official name were used) and the names are inverted so as to bring the derivatives of a parent compound together. Therefore CRC lists dimethyl ketone in the k's and Benzylamine in the t's (Toluene, Amino-). The cross references from synonyms to the name under which compounds are listed are in the tables of CRC. But in Lange, they are listed at the bottom of the page below the tables.

*In Chemical Rubber Company Handbook, paragraphs 1 to 26 on pages C-55 to C-58 and in Lange's Handbook, on pages 375 and 402-3 (1967 ed.) or 7-27 and 7-54-55 (1973 ed.). (Pages will differ in different editions; it is not essential that you use the latest edition.)

The formula indices of the two handbooks are different and in their way represent the two commonly used methods of arranging molecular formulas. In Lange the elements in the formula are arranged using the Richter system. In this system, the elements in an organic compound formula following C (carbon) are arranged H, O, N, S, F, Cl, Br, I. All other elements are in alphabetical order. The formulas are arranged first by the number of carbon atoms, second by the number of different elements, and third by the quantities of these elements. In CRC the system used for arranging the elements in a formula is alphabetical after C (carbon), and H (hydrogen). The formulas are arranged according to increasing numbers of C, H, and remaining elements in alphabetical order.

Below are examples from each of the indices which illustrate the difference between the two systems:

Lange	CRC
C_2H_4	$C_2H_3I_2$
C_2H_5	C_2H_4
$C_2H_3I_2$	C_2H_5
C_2H_5OI	C_2H_5IO
C_3H_3OBr	C_3H_3BrO
$C_3H_3OBr_2$	$C_3H_3Br_2O$

1. Using the "Tables of physical constants of organic compounds" (do not use indices except as a last resort) in the two handbooks, locate the compound number given to 2,2-dimethylpentane (one of the Heptanes).

   The number in Chemical Rubber Company Handbook (CRC) is _____.

   The number in Lange's Handbook is _____.

2. Under what heading was the above compound listed in

   CRC? _____ Lange? _____

3. Do the same as in questions one and two for the following compounds:

   A. Picramic acid

   1. CRC _____

      Lange _____

   2. CRC _____

      Lange _____

3.

B. 2-Methyl-6-nitroquinoline

1. CRC _____

   Lange _____

2. CRC _____

   Lange _____

4. The following elements may be part of an organic compound.. If the compound was in the formula indices in CRC and Lange, in what order would the elements be in the formula?

Br-(Bromine C-(Carbon) Cl-(Chlorine) H-(Hydrogen) O-(Oxygen) S-(Sulfur)

CRC ___ ___ ___ ___ ___ ___ Lange ___ ___ ___ ___ ___ ___

5. Using the list of six compounds below:

(a) write the condensed formula as it would appear in the indices of these two handbooks. You are to do this without consulting the handbooks themselves.

	CRC	Lange
A. benzoquinone $CH\cdot(CH)_3\cdot CO\cdot CO$	_____	_____
B. azoxybenzene $C_6H_5\cdot N(:O):N\cdot C_6H_5$	_____	_____
C. p-bromobenzenesulfonyl chloride $Br\cdot C_6H_4SO_2Cl$	_____	_____
D. brombenzoic acid $Br\cdot C_6H_4CO_2H$	_____	_____
E. chloroiodobenzene $Cl\cdot C_6H_4\cdot I$	_____	_____
F. dichlorobenzene $C_6H_4Cl_2$	_____	_____

(b) Arrange these formulas in the order they would be listed:

CRC	Lange
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Exercise Ib.

The Dictionary of Organic Compounds (frequently called Heilbron, after the editor of the first three editions) is generally the source to check when information beyond that given in the handbooks above is needed. Read the description of the Dictionary on page 1 of your bibliography, then proceed to do one of the following questions as appropriate.

If you last name begins with the letters:

A to F - do question number 7.
G to M - do question number 8.
N to S - do question number 9.
T to Z - do question number 10.

7A. Your interest in the compound 2,2-dimethylpentane goes beyond the basic information in the handbook. The source to check next is the Dictionary of Organic Compounds. The call number is Sci/Ref/QD/251/D4.9/1965. Look up this compound.

Under what heading is it listed?

What physical properties are given which the handbook does not give?

What information is given that is not in either handbook?

7B. Locate the methyl ester of decanoic acid. Where is it listed?

What other types of derivatives (besides esters) of decanoic acid are listed?

What physical property is usually given for these derivatives, even when only one property is given?

7C. What is the melting point of 15,16-dihydroxyoctadecanoic acid?

7D. What is the melting point of 9,12-dihydroxy-stearic acid?

8A. Your interest is the compound 2-methyl-6-nitroquinoline goes beyond the basic information in the handbook. The source to check next is the Dictionary of Organic Compounds. The call number is Sci/Ref/QD/251/D4.9/1965. Look up this compound.

Under what heading is it listed?

Are any properties given which are not in the handbook?

Note the compound 5-methylnonane. What properties are given besides melting point and boiling point?

What information is given that is not in either handbook?

8B. Locate the methyl ester of 4-nitro-2-sulphobenzoic acid. Where is it listed?

What other types of derivatives (besides esters) of nitrosulphobenzoic acid are listed?

What physical property is usually given for these derivatives, even when only one property is given?

8C. What is the melting point of 3-nitrotoluquinone?

8D. What is the metling point of neothiobinupharidine?

9A. Your interest in the compound picramic acid goes beyone the basic information in the handbook. The source to check next is the Dictionary of Organic Compounds. The call number is Sci/Ref/QD/251/D4.9/1965. Look up this compound.

Under what heading is it listed?

Are any physical properties given which are not in the handbook?

Note the compound arctose. What properties are given besides the melting and boiling point?

What information is given in the entry for picramic acid that is not in either handbook?

9B. Locate the methyl ester of 3,5-dinitroanthranilic acid. Where is it listed?

What other types of derivatives (besides esters) are given for this compound?

What property is usually given for these derivatives, even when only one property is given?

9C. What is the melting point of 4-bromoacridine?

10A. Your interest in the compound 1,4-butanedial goes beyond the information given in the handbooks. The source to check next is the Dictionary of Organic Compounds. The call number is Sci/Ref/QD/251/D4.9/1965. Look up this compound.

Under what heading is it listed?

Are any physical properties given which are not in the handbook?

What information is given in the entry for 1,4-butanedial that is not in either handbook?

Chemistry 13

Library Exercise III

April 1975

This exercise is designed to illustrate how Chemical Abstracts can be used to locate information on a specific chemical compound. You should complete the steps outlined below and submit to the Science Library your answer sheet when you have completed the exercise. It will be checked and you will be informed whether the exercise has been completed satisfactorily or unsatisfactorily.

1. Read carefully the attached sheets on the Index Guide. Whenever one uses the subject index to CA it is important to be sure you are using the proper subject entry. This is particularly true for organic compounds since there are several different names by which compounds can be identified, only one of which will be used in the indexes. The cross references from one form to another are not in the indexes, but are collected together in the "Index Guide". But even the "Index Guide" does not have all possible cross references. You should know that many compounds are only listed under the name of the parent compound, e.g., N-acetylaspartic acid is listed only under aspartic acid.

2. Select the compound from page 2 which has the number matching the number in the upper right corner of this sheet. Identify the proper name and form under which literature on that compound is indexed.

3. Read carefully the attached sheets on the subject index to CA. This is a lengthy document but is well worth the time it takes to read it. Having read it, use of the index should be much less confusing. You should focus particularly on the introductory section pages 1 through 4. On pages 4 through 6 read particularly carefully paragraphs 11, 14, 20, and 22.

4. Locate the page in the 1967-71 "Collective Subject Index" on which your topic (compound) first appears.

5. Locate one article on the properties of your compound.

6. Locate one article on the effects of your compound on living organisms.

7. Locate the page, in the Jan.-June 1972 six-month index, on which your topic (compound) first appears.

1. Abscisic acid
2. 1,2 Dihydroacenanthrylene
3. Dipropylacetic acid
4. ACTH
5. ADP
6. Agilon D
7. Allicin
8. Armin
9. Barbital
10. N-Hydroxybenzamide
11. N-Phenylbenzamide
12. Benzamyl
13. Aminobenzene
14. Cocaine
15. DDT
16. 1,1-Dimethoxyethane
17. 1,1-Diphenoxyethane
18. Ethanol
19. Pentamethylethanol
20. Ethyl ketone
21. Eudan
22. Dextrose
23. Indopan
24. Isoamyl iodide
25. Isoamyl sulfide
26. Benzyl ethyl ketone
27. Benzyl methyl ketone
28. LSD 25
29. Methoxymethene
30. 2-Hydroxymenthol
31. Cyanatomethane
32. Ethoxymethane
33. Phenylmethane
34. Tetrabromomethane
35. Tricholomethane
36. Acetylmethanol
37. Muconic acid
38. Mucronic acid
39. Murexide
40. Acetylnaphthol
41. Hexahydronicotinic acid
42. NPA
43. Isooctane
44. Octanedioic acid
45. 1-Pentanol
46. Phenalan
47. Acetylphenazine

CHEMICAL ABSTRACTS®

INDEX GUIDE

INTRODUCTION

This volume of the Index Guide is a collection of cross-references, heading notes, synonyms, and illustrative structural diagrams prepared from 1967 to date, for use in conjunction with the 8th Collective *Subject Index* (Volumes 66 through 75, covering the inclusive period 1967 to 1971). In previous collective volumes, only those cross-references, notes, synonyms, and diagrams were included in the *Subject Index* that were justified by index entries for that particular set of *CA* indexes. Therefore, only a portion of this valuable information was available to the user of a particular collective volume of the *CA* Subject Index. Now this information is included in the Index Guide.

The introduction of information in an effort to make the Index Guide is used in conjunction with the *CA* Subject Index. For an efficient search, one should list the index entries. When the *CA* practice in a subject area is not known, the notes in the Index Guide help determine the correct headings in the *Subject Indexes* should be searched and which entries are actually pertinent.

CAS Registry Numbers are assigned to all unambiguous substances. Each Registry Number is uniquely associated with one definable chemical entity (see *Subject Index* Introduction, ¶¶ 4 and 23).

The following are brief descriptions of the types of entries found in the Index Guide.

1. Cross-references for chemical compounds

In a printed index, it is necessary to choose from a variety of possible names for one that best meets the criteria of *CA*'s indexing policies; once chosen, this name must be used invariably. To guide the index user to this entry, cross-references from other systematic and author-employed names are used liberally in the Index Guide.

Even the simplest of chemical compounds may have many designative names, and it is not possible to include cross-references for all of them, but the Index Guide contains those names most frequently used in the chemical literature for a particular compound and cross-refers these to the preferred *CA* index name. For example, *CA* indexes the compound CH_3-CO-CH_2-CH_3 at 2-Butanone. The systematic names most commonly used in the literature are ethyl methyl ketone and methylacetone; therefore, cross-references of the inverted names Ketone, ethyl methyl and Acetone, methyl- guide the user to 2-Butanone. Less used systematic names, such as Ethane, acetyl- and Butane, 2-oxo-, to name but two of several possibilities, are not included as cross-references in the Index Guide. Cross-references are also made for nonsystematic names which are in general use; for example, Isocrypterodactin, pharmaceutical names, and laboratory designations as an author-employed name for a structure by systematic nomenclature common in the literature, a cross-reference to the correct systematic index name. For example, hexamethylenetetramine would be expected to be found at Cyclohexane, whereas it has a Benzo[2,3]triphenyleno[1,12-gh]one C_6N_4 ring and only seeming to the latter name therefore the Index Guide.

Another form of cross-reference which is a small amount of information in the index is a "guiding" cross-reference. It consists and covers a family of entries, eliminates the printing of a large number of references. By it, the index user to derivatives and analogs of the parent acid, Acetic acid, acetyl- is used. By this, the user is to infer that this encompasses Acetonitrile, and its derivatives. Omission of [illegible] to apply to all pertinent isomers;

Benzoic acid, methyl-
See Toluic acid

leads to the three *Subject Index* headings: *m*-, *o*-, and *p*-Toluic acid and to the many derivatives found under each. Likewise, the cross-reference

Diphenyl, acetamido-
See Acetanilide, o-phenyl-

leads to any of three relevant isomers.

Sometimes the identification of a specific derivative of a compound is not complete in the boldface heading for that compound. Esters, hydrazides, hydrazones, oximes, and some types of *N*-oxides and *S*-oxides, for instance, are identified in the lightface type (the index-type modification, see the *Subject Index* Introduction, ¶9) under the index heading. When this kind of compound is cross-referred, a slightly different form is required. For example:

20 1,4,2-Benzodithiazole
1,3-dioxide—see Pyrocatechol, cyclic [illegible]

SR

ER FOR RESEARCH ON UTILIZATION OF SCIENTIFIC KNOWLEDGE / INSTITUTE FOR SOCIAL RESEARCH / THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN 48106

PROJECT ON SCIENCE EDUCATION IN SCIENTIFIC COMMUNICATION

This project, funded by the National Science Foundation's Division of Science Information, is trying to pull together what is happening in higher education in teaching science and engineering students about scientific communication, information resources, and information systems. We know that many concerned science educators and information specialists are doing innovative things in this area, trying to overcome the process of gradual and incomplete osmosis through which many students learn about the important mechanisms and systems through which they will gather and distribute information during their professional careers. The problem is to find these people, to learn what they are doing, and to link them to others like themselves and to information resources.

We found clusters of activity and partial linkage networks beginning to form, but too often people at one campus are not aware of what is going on across campus or across the state. We need help to overcome this. Below we will list the topics we are interested in; if you are interested in or working on any of these, we may be able to help each other:

1. The role of communication in science: how formal and informal scientific communication works, is improved, and relates to productivity and contributions of scientists.
2. The history and growth of scientific information and the scientific information industry.
3. Individual and organizational strategies for coping with information.
4. Supports and barriers in starting a unit or course in this area; strategies for getting started.
5. Using scientific information resources: information specialists, libraries, reference and support services, computerized and other information systems.
6. Communicating science to scientists and non-scientists.

If you are teaching any of these to your students, are doing research on them, or know someone who is, please let us know. In return for your help we will provide a report containing ideas on innovative curricula, useful information resources, strategies for getting started, and linkages to other people, literature, services, and programs.

Please feel free to pass this sheet around, send us a letter, course outline, ideas, problems you have encountered, "cries for help," or whatever. We will also accept collect calls, and we like visitors, too.

Please contact:

Dr. David A. Lingwood
(313) 764-2560

or

Dr. Stephen D. Nelson
(313) 764-2554

Science Educators' Project
CRUSK, Institute for Social Research
P.O. Box 1248
Ann Arbor, Michigan 48106

David Lingwood
Stephen Nelson
CRUSK
October 18, 1976

CONTENT RESOURCES

INTRODUCTION

This is a hurriedly-prepared listing of some of the key information resources in the various content headings we have developed dealing with scientific communication and STI. We have leaned toward published written scources. These are good places to start for background. Next you might use ISI's SCI or SOCSCI to find more recent authors dealing with topics of interest and citers of precedent authors. Other good sources for further material include the various data files available from Lockheed and SDC, Information Science Abstracts (formerly Documentation Abstracts), the LOEX project (Library Orientation Exchange, Eastern Michigan University, Carolyn Kirkendall, Director), the Annual Review of Information Science and Technology (Carlos Cuadra, ed., Encyclopaedia Britannica, Inc.--check the "information needs and uses" chapters in each yearly edition), and the Journal of the American Society for Information Science.

In terms of local information resources we heartily recommend your library science or library staff members, who will usually have good contact with the field (at least toward the bottom of our content classification). Also, most professional associations have a journal or newsletter covering professional activities--these often cover scientific communication problems, and are good guides to "invisible colleges" dealing with information, and to people you can link to.

LEADS TO POSSIBLE COURSE CONTENT

1. The process of science--usually including coverage of the role of communication in science.

Allison, David (ed.), The R&D Game, Cambridge, Mass.: MIT Press, 1969.

Cole, Jonathan R. and Cole, Stephen, Social Stratification in Science, Chicago: University of Chicago Press, 1973.

Greenberg, Daniel S., The Politics of Pure Science, New York: The New American Library, 1967.

Hagstrom, Warren, The Scientific Community, New York: Basic Books, 1965.

Kuhn, Thomas S., The Structure of Scientific Revolutions, Chicago: University of Chicago Press, 1962. (See 2nd edition for an up-dated Preface.)

Merton, Robert K., The Matthew Effect in Science, Science, 159, Jan., 1968, pp. 56-63.

Merton, Robert K., The Sociology of Science, Chicago: University of Chicago Press, 1973.

Pelz, Donald C., and Andrews, Frank M., Scientists in Organizations, New York: Wiley, 1966. (Also revised edition, Ann Arbor: Institute for Social Research, 1976.)

Price, Derek J. DeSola, Science Since Babylon, New Haven: Yale University Press, 1961.

Shils, Edward (ed.), Criteria for Scientific Development, Public Policy and National Goals, Cambridge, Mass.: MIT Press, 1968.

Watson, James D., The Double Helix, New York: Atheneum, 1968.

2. The Growth of Science and Scientific Information

Crane, Diana, Invisible Colleges: Diffusion of Knowledge in Scientific Communities, Chicago: University of Chicago Press, 1972. (See Chapter 2 and the bibliography of this key book for more references.)

Institute for Scientific Information, "The Paper Blizzard" (film), Philadelphia, Pa.: ISI.

Price, Derek J. DeSola, Little Science Big Science, New York: Columbia University Press, 1963.

3. Quantity, Quality, and Assessment of Scientific Performance

Cole, J.R., and Cole S. (see section 1 above).

Gaston, Jerry, Originality and Competition in Science: A Study of the British High Energy Physics Community, Chicago: University of Chicago Press, 1973.

Whitley, Richard and Frost, Penelope, The Measurement of Performance in Research, Human Relations, 24, 1971, pp. 161-178.

NOTES: (1) Many of the works in Section 1 cover this topic as well. (2) Much of the current debate among researchers of science (and department chairmen, too) involves use of citation indices to measure performance. Garfield at ISI is in the middle of this, the Cole and Cole book covers it, and also see: Cole, J., and Cole S., Measuring the Quality of Sociological Research: Problems in the Use of the Science Citations Index, The American Sociologist, 6, 1971, pp. 23-29.

4. Scientific Communication
(See many of the above, plus:)

de Reuck, A., and Knight, A. (eds.), Symposium on Communication in Science, Boston, Mass.: Little, Brown, 1967.

Herner, Saul, A Brief Guide to Sources of Scientific and Technical Information, Washington, D.C.: Information Resources Press, 1970.

Nelson, Carnot E., and Pollock, D.K. (eds.), Communication among Scientists and Engineers, Lexington: D.C. Heath, 1970.

Paisley, William J., The Flow of (Behavioral) Science Information: A Review of the Research Literature, Stanford: Institute for Communication Research, 1965. (May be out of print--need to check availability through ERIC and NTIS.)

Rosenbloom, Richard S. and Wolek, Francis W., Technology, Information, and Organization: Information Transfer in Industrial R&D, Cambridge: Harvard University, 1967.

5. Use of STI: Courses, Systems, and Resources
(The DiSalvo case studies are good here, as is the Annual Review of Information Science and Technology; check recent issues first.)

Barber, A., Stephanie, Barraclough, Elizabeth D., and Gray, W. Alexander, On-Line Information Retrieval as a Scientist's Tool, Information Storage and Retrieval, 9, 1973, pp. 429-440.

Borman, Lorraine, and Mittman, Benjamin, Interactive Search of Bibliographic Data Bases in an Academic Environment, Journal of American Society for Information Science, 23, 1972, pp. 164-171.

Caruso, Elaine, Tutorial Programs for Operation of On-Line Retrieval Systems, Journal of Chemical Documentation, 10, 1970, pp. 98-105.

Elman, Stanley A., Cost Comparison of Manual and On-Line Computerized Literature Searching, Special Libraries, 66, 1975, pp. 12-18.

Fanta, P.F., and Sydney, I.M., Modern Techniques in Chemical Information: A New Graduate-Undergraduate Course at Illinois Institute of Technology, Journal of Chemical Documentation, 11, 1971, pp. 98-99.

Herner, Saul, An Experimental Course in Information Gathering for Scientists and Engineers, Journal of Chemical Documentation, 9, 1969, pp. 99-102.

Keenan, Stella (ed.), Key Papers on the Use of Computer-based Bibliographic Services, Washington, D.C.: American Society for Information Science. National Federation of Abstracting and Indexing Services, Philadelphia, 1973.

Kennedy, James R., Kirk, Thomas, and Weaver, Gwendolyn A., Course-Related Library Instruction, A Case Study of the English and Biology Departments at Earlham College, Drexel Library Quarterly, 7, 1971, pp. 277-297.

Lancaster, F.W., and Fayen, E.G., Information Retrieval On-Line, Los Angeles: Melville Publishing Co., 1973.

Lubans, John, Educating the Library User, New York: R.R. Bowker, 1974.

Martin, D.F., and Robison, E., Who's Teaching Chemistry Literature These Days?, Journal of Chemical Documentation, 9, 1969, pp. 95-99.

Milby, T.H., Teaching Biological Literature, BioScience, 23, 1973, pp. 663-665.

National Bureau of Standards, U.S. Department of Commerce. Reference Collection of Information on Worldwide Engineering Information Systems and Services. Address: NBS/DoC, Washington, D.C. 20234. Contact Person: Mrs. Cheryl Wise (301) 921-2587.

Schneider, John H., et al., (eds.), Survey of Commercially Available Computer-Readable Bibliographic Data Bases, Washington, D.C.: American Society for Information Science, 1973.

Sewell, Winifred, Use of MEDLINE in a Medical Literature Course, Journal of Education for Librarianship, 15, 1974, pp. 34-40.

U.S. Government, Federal Science and Technology Communication Activities. NTIS: PB 253-975 ($5.50 paper, $2.25 fiche). (Lists technology transfer activities, data bases, and scientific publications for each federal agency.)

Wood, D.N., Instruction in the Use of Scientific and Technical Literature, Library Association Record, 70, 1968, p. 13.

Woodburn, H.M., Retireval and Use of the Literature of Inorganic Chemistry, Journal of Chemical Education, 49, 1972, pp. 689-696.

Finally (!) the following provides good advice, lists supplementary materials for popular data bases, talks some about terminals, etc.:

Wax, David M., A Handbook for the Introduction of On-Line Bibliographic Search Services into Academic Libraries, Occasional Paper #4, Office of University Library Management Studies, Association of Research Libraries, 1527 New Hampshire Ave., N.W., Washington, D.C. 20036 ($5.00).

General Biology: Library Quiz (10-74)

#5

Name: ~~Last~~ First

1. What is your status at Earlham?

   A. Freshman

   B. Sophomore

   C. Junior

   D. Senior

1a. Which exercise did you complete?

   A. Ecology

   B. Genetics

   C. Octopus

2. In which division is your major field of study likely to be?

   A. Humanities

   B. Social Sciences

   C. Sciences

   D. Other

   E. Unknown

8. As a beginning student in biology who wants to study root growth, I should start my library search by:

   A. studying encyclopedias and texts that have material on plant development

   B. looking up root growth in the card catalog

   C. checking a dictionary of botanical terms

   D. reading my text

10R. The subject headings under which a particular library book (which you know about) is listed can be identified by:

   A. checking the "red book" (L.C. list of subject headings)

   B. checking the subject half of the card catalog under the key words from the title

   C. looking at tracings at bottom of author card in the card catalog

   D. finding the book's classification number and looking it up in the classification tables

12. The card catalog is a limited bibliographic tool because:

   A. It does not index chapters or parts of books

   B. It lists only books in the library

   C. It does not index periodical articles

   D. All of the above

13R. The symbol "sa" in the Library of Congress list of subject headings (the "red book") list means:

A. see also for related more specific headings

B. see also for related more general headings

C. see also for more general(or nearly synonomous) headings

D. All of the above

15. A key-word index is difficult to use because:

A. multiple access to individual titles means a large number of useless terms are included

B. it uses the language of the field and is thus standardized

C. handling large numbers of terms makes publishing the index slow

D. there is only one entry for each title

16. The Science Citation Index is a good index for beginners in a subject field because:

A. it doesn't use subject headings

B. it is easy to learn to use it

C. it is interdisciplinary

D. it is more up to date than most other science indexes

18. The Reader's Guide to Periodical Literature is not a good index to use in a search of the biological literature because:

A. it doesn't cover any important scientific journals

(B.) it covers only a few important scientific journals

C. the index is not precise enough for searching a scientific subject

D. the time delay in publication makes coverage of very recent literature impossible

19R. In recent years (since World War II) a new class of scientific literature has developed and become one of the most important sources of information for the undergraduate. These annual review-type publications are useful (and important to undergraduates) because:

A. they provide entertaining popularized reviews of scientific topics

B. they report the latest research

C. they provide a good up-to-date substitute for textbooks

(D.) they review and evaluate the recent literature on a topic

21. Search strategy suggests going from general works to the most specific works in a step by step process. If this strategy is used, the literature would be consulted in the order:

A. Research articles, Reviews, Treatises, Texts and Encyclopedias

B. Reviews, Treatises, Research articles, Texts and Encyclopedias

C. Texts and Encyclopedias, Treatises, Reviews, Research articles

D. Texts and Encyclopedias, Research articles, Reviews, Treatises

22. To find out if the library has the following references you would look in the:

A. card catalog

B. serials list

1. Koopman. Evolution 4:135-138.

2. Roe. Behavior and Evolution. (1958).

3. Hoskins. Annual Review of Applied Entomology 1:89-117 (1956).

4. Holden. "Organochlorine Insecticide Residues in Salomid Fish", Journal of Applied Ecology 23:45-53 (1966).

5. Harrison. "Some Considerations in the Formulation of Human Phylogeny", in Washburn, Classification and Human Evolution (1963).

7. "Organic Insecticides", McGraw-Hill Encyclopedia of Science and Technology 7:140 (1966).

8. Robinson. "Relationships and Trends in Hominal Evolution", in Symposium on Time and Stratigraphy in the Evolution of Man (1967).

On the following page is a list of cards all of which appear under the subject heading "genetics". You are working on each of the topics below and need information as indicated. List your first and second choice books for each topic and why you chose them.

Beginning a paper on genetics and need an introductory text:

29. 1st choice:

30. 2nd choice:

31. Why?

I am a biology major who is writing a paper on the structure of DNA and need detailed material on the subject:

32. 1st choice:

33. 2nd choice:

34. Why?

General Biology: Library Quiz (10-74)
Distribution of scores, 1975-76

Perfect score is 22.

Score	Number of subjects getting that score
22	0
21	1
20	3
19	11
18	6
17	16
16	20
15	26
14	22
13	22
12	18
11	9
10	3
9	6
8	7
7	3
6	10
5	0
4	3
3	0
2	1
1	0
0	0
Mean	13.5

Post Office Box #

Name

1st term ☐ 1st exam ☐ 2nd exam
2nd term ☐ exam

The evaluation criteria below are an attempt to give you an "objective evaluation" of the quality of the bibliography included with your library exam. The criteria do not take into account the peculiarities of the literature of the particular area of your topic. Rather it attempts in a general way to indicate the quality of your bibliography as it relates to the general criteria listed below. We in the library would be ahppy to discuss with you why your score was low and how your use of the library could have been better. Your professor has not seen this evaluation sheet, and the score is not part of the grading on which your course grade depends.

Tom Kirk

Criteria	Score
1. The appropriateness of the material cited as sources of information for a scholarly paper in biology. (Appropriateness = reputation of source, age of source, etc.)	5 4 3 2 1 0
2. The appropriatness of the material cited as sources of information for the particular subject being studied. (Appropriateness = reputation of source, age, author authority)	5 4 3 2 1 0
3. A reasonable number of primary sources, from a variety of titles. This shows some confrontation with the indexing services that are available. (1 point/source)	5 4 3 2 1 0
4. Inclusion of the several most important secondary sources and texts in the field being studied. (2 points/source)	5 4 3 2 1 0
5. Number of references. Anything less than 10 items would raise the question of completeness. This will vary greatly from subject to subject and must be considered a minor point. (less than 4 sources-0 points; 4-6 sources-1 pt.; 7-9 sources-2 pts.; 10 or more sources-3 pts.)	3 2 1 0
6. Consistent acceptable format used in the cited literature section. (Inconsistent format, incomplete information-0 pts.; inconsistent format, complete information-1 pt.; unacceptable consistent format, complete information-2 pts.; acceptable, consistent format with complete information-3 pts.)	3 2 1 0

Bibliography Evaluation Results
Perfect score is 26

1975-76

Score	Number of subjects getting that score
26	8
25	16
24	18
23	13
22	18
21	20
20	15
19	17
18	13
17	19
16	6
15	8
14	2
13	5
12	0
11	2
10	0
Mean	18.7

1973-74

Section	Mean score
1	19.0
2	20.0
3	21.0
4	19.5
5	18.0
6	23.0
7	20.0
8	19.0

1968-69

Lecture group: Mean score: 18.6

Exercise group: Mean score: 16.3

SA=Strongly Agree
A=Agree
D=Disagree
SD=Strongly Disagree
n=Number of respondents

LIBRARY USER'S OPINION SCALE RESULTS

	SA %	A %	D %	SD %	n=
1. I get a pleasant feeling of anticipation when I go to a library.					
A.	1.7	22.7	62.2	13.3	358
B.	4.0	51.0	34.0	11.0	100
C.	14.7	45.9	36.1	3.3	61
D.	4.1	59.9	30.6	6.1	49
E.	18.7	64.7	15.2	1.4	283
2. The main job of a librarian is to check out books, send out overdue notices, and collect fines.					
A.	10.9	70.1	18.7	0.3	358
B.	0.0	1.9	30.1	68.0	103
C.	0.0	11.9	29.9	58.2	67
D.	0.0	1.9	40.4	57.7	52
E.	0.0	6.3	56.8	36.8	285
3. Anything that you can't learn about the use of a library in an hour is probably not worth knowing.					
A.	46.9	45.5	7.3	0.3	371
B.	2.0	3.0	33.3	61.8	102
C.	1.6	0.0	50.0	48.4	64
D.	0.0	0.0	43.1	56.9	51
E.	0.0	2.1	55.0	42.9	289
4. I feel well able to do research in the library.					
A.	4.1	19.2	66.8	9.4	365
B.	17.1	69.6	12.7	0.0	99
C.	20.9	61.2	17.9	0.0	67
D.	19.6	74.5	2.0	3.9	51
E.	12.3	60.8	24.8	2.1	281
5. Trained librarians have skills that can make a vast different in what one can get hold of.					
A.	0.6	2.2	41.7	55.5	362
B.	66.9	32.0	0.1	0.0	103
C.	71.9	28.1	0.0	0.0	64
D.	61.5	32.7	3.8	1.9	52
E.	53.0	43.9	3.1	0.0	287
6. In researching for a term paper, I often feel that there are materials on my topic that I've somehow overlooked.					
A.	0.3	16.8	55.1	27.8	356
B.	27.5	57.8	14.0	0.0	102
C.	22.3	59.8	17.9	0.0	67
D.	15.4	53.8	30.8	0.0	52
E.	18.6	61.5	19.3	0.6	275

7. If I do not feel that I'm finding what I need in the library, I usually ask a librarian for help.

A.	0.3	6.7	59.2	33.8	358
B.	25.7	63.4	10.9	0.0	101
C.	40.3	49.3	10.4	0.0	67
D.	28.9	59.6	11.5	0.0	52
E.	36.8	60.7	2.5	0.0	280

8. Most librarians, according to my impression, are rather stuffy.

A.	15.0	58.4	23.1	3.5	341
B.	2.1	9.3	63.9	24.7	97
C.	3.0	4.5	72.7	19.8	66
D.	1.96	7.84	64.7	25.5	51
E.	1.1	11.8	57.8	29.3	287

9. When I do research in the library for a paper, I usually feel that my search for materials has been successful.

A.	2.7	24.2	66.8	6.1	365
B.	6.0	80.0	14.0	0.0	100
C.	10.6	71.2	17.0	1.2	66
D.	5.8	82.7	9.6	1.9	52
E.	5.1	73.6	20.9	0.4	277

10. Librarians commonly give the impression that they'd rather not be bothered by people wanting special help.

A.	16.4	53.8	27.8	2.0	359
B.	1.0	15.8	65.3	17.8	101
C.	1.2	9.1	56.1	33.6	66
D.	1.9	3.8	65.4	28.8	52
E.	2.5	9.5	56.8	31.2	285

11. Learning how to use the library efficiently is not very difficult.

A.	3.8	61.9	32.1	2.2	312
B.	9.0	54.0	32.0	5.0	100
C.	54.5	36.5	4.5	4.5	66
D.	3.8	59.6	26.9	9.6	52
E.	13.0	70.1	14.8	1.1	277

A. Freshmen, 1975-76, Beginning
B. GB Freshmen, 1975-76, Term II
C. Sample of seniors, class of 1976, Term II
D. Biology, Chemistry, Geology majors--Seniors, 1976--Term II
E. Freshmen, 1976-77, Beginning

Four-year Bound Periodical Use Survey
Wildman Science Library, Earlham College
1973-1977

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use 18,646	Subscription price (Moore Cottrell '77)	Cumulative % of total budget ('76-'77) for all titles =$7,770
1	Science	2465	13.2	$ 60.00	.77%
2	Nature	1730	22.4	98.00	2.03
3	American Chem. Soc. Jrl.	1234	29.1	112.00	3.47
4	Scientific American	995	34.4	15.00	3.66
5	Jrl. of Biological Chem.	629	37.8	200.00	6.24
6	Lancet	489	40.4	30.00	6.62
7	Ecology	481	43.0	42.00	7.16
8	New England Jrl. of Med.	406	45.2	22.00	7.45
9	Jrl. of Cell Biology	387	47.2	NRS	7.45
10	Nat'l. Acad. of Sci. Proc.	384	49.3	55.00	8.15
11	Evolution	356	51.2	25.00	8.48
12	Chem. Soc. (London). Jrl.	342	53.0	895.00	20.00
13	American Naturalist	322	54.8	24.00	20.30
14	Biochemistry	321	56.5	104.00	21.64
15	Jrl. of Mammalogy	292	58.0	21.00	21.91
16	Animal Behavior	275	59.5	60.00	22.68
17	Jrl. of Molecular Biology	250	60.9	470.85	28.74

Four-year Bound Periodical Use Survey - page 2

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
18	British Medical Journal	241	62.2	$ 56.00	29.47%
19	Auk	219	63.3	20.00	29.72
20	Amer. Jrl. Clinical Nutrition	218	64.5	30.00	30.07
21	Plant Physiology	189	65.5	100.00	31.36
22	American Scientist	176	66.5	NRS	31.36
23	N.Y. Academy of Sci. Annals.	158	67.3	40.00	31.87
24	Journal of Bacteriology	150	68.1	105.00	33.22
25	Quarterly Review of Biology	147	68.9	24.00	33.53
26	Animal Behavior Monographs	140	69.6	NLS	33.53
27	American Medical Assoc. Jrl.	137	70.4	NRS	33.53
28	Journal of Chemical Education	127	71.1	9.00	33.65
29	Analytical Chemistry	124	71.7	12.00	33.80
30	American Midland Naturalist	123	72.4	20.00	34.06
31	Federation Proceedings	111	73.0	38.00	34.55
32	American Journal of Botany	108	73.6	34.00	34.99
33	Cold Spring Harbor Symposia	106	74.1	55.00	35.68
34	Ecology Monographs	105	74.7	20.00	35.95
35	BioScience	104	75.3	32.00	36.36
36	New Scientist	103	75.8	49.00	36.99

Four-year Bound Periodical Use Survey - page 3

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
37	Condor	97	76.3	$ 20.00	37.25
38	Journal of Organic Chemistry	96	76.8	104.00	38.59
39	Behaviour	95	77.3	105.42	39.95
40	Amer. Assoc. Petroleum Geologists. Bulletin	93	77.8	50.00	40.59
41	Jrl. of Mammalogy. Supplement	92	78.3	NRS	40.59
42	Chemical Reviews	87	78.8	60.00	41.36
43	Botanical Review	86	79.3	16.00	41.57
43	Jrl. of Geophysical Research	86	79.7	220.00	44.40
44	Angewandt Chemie	83	80.2	115.50	45.89
45	Astrophysical Journal	82	80.6	130.00	47.56
45	Developmental Biology	82	81.1	255.50	50.85
46	American Jrl. of Medicine	77	81.5	NLS	50.85
46	Archives of Environmental Health	77	81.9	18.00	51.08
46	Audubon	77	82.3	13.00	51.25
46	Geological Soc. of Amer. Bulletin	77	82.7	74.00	52.20
47	Jrl. of Experimental Biology	75	83.1	95.00	53.42
48	Physics Today	74	83.5	24.00	53.73
49	Endocrinology	73	83.9	35.00	54.18
49	Tetrahedron	73	84.3	NLS	54.18

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
50	Journal of Geology	72	84.7	$ 26.00	54.52
51	Chemistry	70	85.1	8.00	54.62
52	Physiological Reviews	66	85.4	30.00	55.00
52	Psychophysiology	66	85.8	30.00	55.39
53	Biological Bulletin	64	86.1	44.00	55.57
54	Jrl. of Chemical Physics	62	86.4	195.00	58.08
55	Bacteriological Reviews	61	86.8	20.00	58.34
56	Natural History	59	87.1	NLS	58.34
57	Psychonomic Science	58	87.4	NLS	58.34
57	Sky & Telescope	58	87.7	10.00	58.47
58	Entomological Soc. of Amer. Annals	56	88.0	34.50	58.91
59	Copeia	54	88.3	20.00	59.17
60	Water Pollution Control Fed. Jrl.	53	88.6	35.00	59.62
61	Jrl. of Physical Chemistry	51	88.8	NLS	59.62
62	Jrl. of Experimental Zoology	50	89.1	NLS	59.62
63	Chemical Soc. (London). Quarterly	48	89.4	NLS	59.62
63	Genetics	48	89.6	35.00	60.07
64	Physiological Zoology	47	89.9	NLS	60.07
65	Nutrition Reviews	46	90.1	12.00	60.22

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
66	Biological Reviews	45	90.4	$ 35.00	60.67
66	Inorganic Chemistry	45	90.6	96.00	61.91
66	Pediatrics	45	90.9	NLS	61.91
67	Physical Review	44	91.1	NLS	61.91
68	Limnology & Oceanography	43	91.3	25.00	62.23
69	Chemical & Engineering News	42	91.5	17.50	62.46
70	American Jrl. of Science	40	91.8	40.00	62.97
70	Entomological Soc. of Amer. Bull.	40	92.0	10.00	63.10
71	Environmental Science & Tech.	37	92.2	30.00	63.49
71	Jrl. of Economic Entomology	37	92.4	NLS	63.49
72	Economic Botany	36	92.6	22.00	63.77
73	American Zoologist	35	92.8	28.00	64.13
74	Accounts of Chemical Research	34	92.9	40.00	64.64
75	Postgraduate Medicine	33	93.1	NRS	64.64
76	Jrl. of Paleontology	32	93.3	52.80	65.32
76	Ohio Jrl. of Science	32	93.5	NLS	65.32
77	Jrl. of Pediatrics	31	93.6	NLS	65.32
78	Jrl. of Cellular Physiology	30	93.8	95.00	66.55
78	Jrl. of Forestry	30	93.9	24.00	66.85

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
78	Physical Review Letters	30	94.1	$ 85.00	67.95
78	Phytophathology	30	94.3	NLS	67.95
79	Pesticides Monitoring Jrl.	29	94.4	NRS	67.95
80	Amer. Jrl. of Physics	27	94.6	38.00	68.44
80	Arctic	27	94.7	NLS	68.44
81	Canadian Jrl. of Botany	26	94.8	60.00	69.21
81	Experimental Neurology	26	95.0	NLS	69.21
81	Medical Aspects of Human Sex.	26	95.1	NRS	69.21
82	Griffith Observer	25	95.3	5.00	69.27
82	Jrl. of Nutrition	25	95.4	NLS	69.27
82	Soil Science	25	95.5	NLS	69.27
83	Experimental Brain Research	24	95.7	NLS	69.27
83	Experimental Cell Research	24	95.8	NLS	69.27
83	Nat'l. Cancer Institute. Jrl.	24	95.9	NRS	69.27
84	Behavioral Biology	23	96.0	NLS	69.27
84	Plant Disease Reporter	23	96.2	NRS	69.27
85	Biochemical Journal	20	96.3	NLS	69.27
85	Jrl. of Clinical Endocrinology	20	96.4	NLS	69.27
86	Biochimica et Biophysica Acta	19	96.5	NLS	69.27
86	Geological Soc. of Amer. Proc.	19	96.6	NLS	69.27

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
86	Vision Research	19	96.7	NLS	69.27
87	Chemical Soc. (London). Annual Rep.	18	96.8	NLS	69.27
88	Amer. Geophysical Union. Trans.	17	96.9	$ 25.00	69.62
88	Biological Conservation	17	97.0	57.00	70.36
88	Jrl. of Medical Education	17	97.1	NRS	70.36
89	Water Research	16	97.1	NLS	70.36
90	American Birds	15	97.2	8.00	70.46
90	Astronomy	15	97.3	12.00	70.61
90	Indiana Audubon Quarterly	15	97.4	NRS	70.61
90	Jrl. of Animal Ecology	15	97.5	NLS	70.61
90	Water Resources Research	15	97.5	NLS	70.61
91	Psychopharmacology Bulletin	14	97.6	NRS	70.61
92	American Biology Teacher	13	97.7	18.00	70.84
92	Science & Technology	13	97.8	NLS	70.84
93	Perspectives in Bio. & Med.	12	97.8	NLS	70.84
94	Astronomical Journal	11	97.9	55.00	71.55
94	Economic Geology	11	97.9	28.00	71.91
94	Optical Soc. Journal	11	98.0	NLS	71.91
94	Theoretica Chimica Acta	11	98.1	NLS	71.91
94	Turtox News	11	98.1	NLS	71.91

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
95	Audubon Field Notes	10	98.2	NLS	71.91
95	Jrl. of Heredity	10	98.2	NLS	71.91
95	Jrl. of Parasitology	10	98.3	$ 35.00	72.36
95	Reviews of Modern Physics	10	98.3	40.00	72.88
96	American Forests	9	98.4	NRS	72.88
96	Botanical Gazette	9		24.00	73.19
96	Endeavor	9		NLS	73.19
96	Medical World News	9		NRS	73.19
96	Modern Medicine	9		NRS	73.19
96	Progressive Fish Culturist	9		NRS	73.19
97	Jrl. of Agricultural Research	8	98.7	NLS	73.19
98	Alaska Industry	7	98.7	NLS	73.19
98	Antarctica Jrl. of the U.S.	7		NRS	73.19
98	Chemical Soc. (London). Proc.	7		NLS	73.19
98	Clinical Pharm. & Therapeutics	7		NLS	73.19
98	Fishery Bulletin	7		NRS	73.19
98	Jrl. of Biological Psychology	7		5.00	73.25
99	Amer. Jrl. of Diseases of Children	6	98.9	NLS	73.25
99	Contemporary Physics	6		NLS	73.25

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
99	Infectious Diseases	6	99.0	NRS	73.25
99	Jrl. of Applied Physics	6		NLS	73.25
99	Jrl. of Sedimentary Petrology	6		$ 33.00	73.68
99	Mayo Clinic Proceedings	6		NRS	73.68
99	QST	6		9.00	73.79
99	Technology Review	6		15.00	73.98
100	Chemistry & Industry	5	99.2	NLS	73.98
100	Jrl. of Chemical & Engineering Data	5		NLS	73.98
100	Jrl. of Glaciology	5		NLS	73.98
100	N.Y. Academy of Sci. Transactions	5		NLS	73.98
100	Psychonomic Soc. Bulletin	5		40.00	74.31
100	Soil Science Soc. Proceedings	5		22.00	74.59
101	Canadian Field Naturalist	4	99.3	NLS	74.59
101	Critical Reviews in Envirn. Control	4		60.00	75.36
101	Internat'l. Jrl. of Math Education	4		50.00	76.01
101	Pediatric Research	4		NLS	76.01
102	Bulletin of Entomological Research	3	99.4	NLS	76.01
102	Cambridge Phil. Soc. Proceedings	3		NLS	76.01
102	Chemische Berichte	3		NLS	76.01

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
102	Geotimes	3	99.5	$ 9.00	76.12
102	IEEE Proceedings	3		NLS	76.12
102	Jrl. of Chemical Documentation	3		NLS	76.12
102	Jrl. of General Microbiology	3		NLS	76.12
102	Jrl. of Research (NBS), Sects. A&B	3		NRS	76.12
102	Medical Tribune	3		NRS	76.12
102	Mercury	3		NRS	76.12
102	NOAA	3		NRS	76.12
102	Reports on Progress in Physics	3		135.00	77.86
102	Review of Applied Entomology	3	99.6	NLS	77.86
102	Science Books & Films	3		16.00	78.06
102	Seismological Soc. of Amer.	3		NLS	78.06
102	Southeastern Geology	3		6.00	78.14
102	Stain Technology	3		NLS	78.14
102	Water Spectrum	3		6.20	78.22
103	Amer. Microscopical Soc. Trans.	2	99.7	15.00	78.41
103	Annals of Math Statistics	2		NLS	78.41
103	Astron. Soc. Pacific. Pubs.	2		40.00	78.93
103	Bild der Wissenschaft	2		NLS	78.93

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
103	Carribean Jrl. of Science	2	99.7	$ 5.00	78.99
103	Chemistry in Britain	2		55.00	79.70
103	Chesapeake Science	2		12.00	79.85
103	Earth Science Review	2		NLS	79.85
103	Inorganica Chimica Acta	2		NLS	79.85
103	Jrl. of Petroleum Technology	2		NLS	79.85
103	Mining Engineering	2		NLS	79.85
103	Oil & Gas Journal	2	99.8	NRS	79.85
103	Physics Education	2		40.00	80.37
103	Physics Teacher	2		18.00	80.60
103	Reviews of Geophysics & Space	2		60.00	81.37
103	Reviews of Sci. Instrumentation	2		NLS	81.37
104	Agricultural Science Review	1	99.9	NLS	81.37
104	Amer. Math Soc. Bulletin	1		NLS	81.37
104	Amer. Math Soc. Proceedings	1		NLS	81.37
104	American Mineralogist	1		50.00	82.02
104	Annotated Bibliog. of Econ. Geol.	1	99.9	NLS	82.02

Overall Rank (1973-77)	Title	Total Use 1973-77	Cumulative % of total use	Subscription price (Moore Cottrel '77)	Cumulative % of total budget ('76-'77) for all titles (=$7770)
104	CA: Cancer Jrl.	1	99.9	NRS	82.02
104	Communications in Behavioral Bio.	1		NLS	82.02
104	Computing Surveys	1		$ 30.00	82.40
104	Helvetia Chimica Acta	1		NLS	82.40
104	Icarus	1		144.00	84.25
104	Jrl. of Environmental Quality	1	99.9	NLS	84.25
104	MD: Medical News Magazine	1		NRS	84.25
104	Medical Economics	1		NRS	84.25
104	Medicine & Science in Sports	1		18.00	84.49
104	Optical Spectra	1		NLS	84.49
104	Physiological Psychology	1		20.00	84.74
104	Quaternary Research	1	100.0	60.00	85.52

General Biology (Jerry Woolpy)
Course Evaluation
1968-69, The first year that the library component was used.

(Enrollments 79% Freshmen, 18% Sophomores, 1% Juniors, 2% Seniors.)

I Selected items which relate to library assignments:

#3 Library

A) Was overemphasized-30% agreed
Appropriately emphasized-69% agreed (n=96)
Not emphasized enough-1% agreed

B) Comment briefly on the library examinations as an educational devise.

It was valuable - 92% agreed
It was not valuable - 8% agreed (n=87)

#7 Examinations (hour exams)

C) I learned less from them than library exams 48% agreed
" " the same amount from each type 26% agreed (n=42)
" " more from them than library exams 26% agreed

D) I worked harder for library exams than for hour exams 93% agreed
" " " " hour exams than for library exams 7% agreed (n=42)

#9 Measurment of course

A) This is the best course I've taken at EC 28% agreed
better than most 47% agreed
average 15% agreed (n=93)
worse than some 10% agreed
worst 0% agreed

B) I worked harder in this course than others 85% agreed
average 12% agreed (n=94)
less hard 3%

C) The average number of hours per week spent in and out of class for this course was

less than 10	29%
10-15	44%
15-20	19%
greater than 20	8%

(n=86)

II Expected grade correlated with amount learned on library exams:

If student expected an A (n=9)

33% claimed to learn more from library than hour exams

If student expected a B (n=32)

25% claimed to learn more from library than hour exams

If student expected a C (n=10)

50% claimed to learn more from library than hour exams.

III Similar results were recorded in later years. The library component has always been one of the more difficult but also more appreciated aspects of our course. Graduating seniors frequently recalled the library component of general biology as one of the more memorable aspects of their educations. Our grads who have gone on in biology report especially favorable competence relative to students from other schools.

NSF Workshop: Course Related Library and Literature Use Instruction in Undergraduate Science Education

Earlham College
October 1976

Workshop Evaluation Results

1. Was the workshop what you expected? YES *and* NO
   (7) (1),
   I really was not quite sure of what I expected.

2. What things didn't you get that you expected or wanted?
   I'm too naive to know what I should have expected. I received a very acceptable quality and quantity of things.
   I was disappointed that so few colleges have library instruction in engineering and technology of a calibre that matches the instruction that has been developed for the sciences and humanities.
   Nothing (2)
   I got more than I expected, particularly lots of paper which will be very useful.
   A greater number of student and faculty contacts.

3. What unexpected things did you get?
   The unexpected range of backgrounds, philosophies, and personalities that existed among the participants. I had a more stereotyped image of participants.
   Astronomy class library instruction with students of varying levels of competence.
   A lot more detail and new insights about overall problem.
   Good company.
   Outstanding enthusiasm of organizer and much valuable help.
   More stimulation from other teams than I anticipated.
   Such good food and such good fellowship. Excellent talk on evaluation.
   Marvelous mix of people; rewarding and refreshing.

4. What do you think of the following parts of the workshop:

	Interesting					Useful				
	Low				High	Low				High
	1	2	3	4	5	1	2	3	4	5
Role playing	*0*	*0*	*2*	*2*	*5*	*0*	*1*	*0*	*2*	*5*
Descriptions of other programs	1	2	3	4	5	1	2	3	4	5
	0	*0*	*2*	*5*	*2*	*0*	*1*	*1*	*3*	*4*
LOEX Display	1	2	3	4	5	1	2	3	4	5
	3	*2*	*2*	*2*	*0*	*2*	*4*	*0*	*1*	*1*
Evaluation session (Wed. night)	1	2	3	4	5	1	2	3	4	5
	0	*0*	*0*	*4*	*4*	*0*	*2*	*0*	*2*	*4*
Work on your own project	1	2	3	4	5	1	2	3	4	5
	0	*0*	*3*	*1*	*5*	*0*	*0*	*2*	*1*	*6*

4. (continued)

Discussion with Kirk/Woolpy	1	2	3	4	5		1	2	3	4	5
	0	*0*	*0*	*2*	*7*		*0*	*0*	*1*	*0*	*8*

5. Please rate the following aspects of the workshop:

	Poor				Excellent
Sleeping facilities	1	2	3	4	5
	0	*0*	*0*	*3*	*5*
Food at Yokefellow	1	2	3	4	5
	0	*0*	*1*	*2*	*5*
Food at Jones House	1	2	3	4	5
	0	*0*	*1*	*1*	*6*
Food at college dining room	1	2	3	4	5
	0	*0*	*1*	*3*	*4*
Pace of the workshop	1	2	3	4	5
	0	*0*	*1*	*3*	*4*
	Too fast on Wednesday, absolutely exhausting for me.				
Workshop meeting place in Wildman Science Library	1	2	3	4	5
	0	*0*	*1*	*2*	*6*
Speakers: Bakker	1	2	3	4	5
	0	*0*	*1*	*1*	*7*
Kirk	1	2	3	4	5
	0	*0*	*0*	*1*	*9*
Woolpy	1	2	3	4	5
	0	*0*	*0*	*1*	*8*
Farber	1	2	3	4	5
	0	*0*	*2*	*4*	*3*
Johnstone	1	2	3	4	5
	0	*0*	*1*	*4*	*4*
Johnson	1	2	3	4	5
	0	*0*	*1*	*5*	*4*
Handouts	1	2	3	4	5
	0	*0*	*0*	*3*	*7*

6. How would you improve on the organization and management of the workshop?
Really don't know except perhaps slow pace first day.
Could you (Kirk?) pawn off some of the fetching, delivering, etc. on someone else? For us it was great, but you ought to have a little freedom.
1. Allow more time for individual projects;
2. More contact with students;
3. Too much sitting in room, especially in afternoon. Energy lag at that time. Participants might do their own interests in afternoon;
4. Organize <u>one</u> evening with additional faculty.
Two full days with one evening session would probably be adequate, although longer time allows more personal interaction.
More time out in the fresh air.
I don't know how. It was very well run. The diversity of the 4 teams contributed importantly to my education.
I couldn't. It was great.

7. As you leave this workshop you feel (Circle all that apply):

You wasted your time.*0* Physically tired.*2* Excited.*5* Challenged.*8*

You were overworked.*0* You have a clear idea of what you need to do. *4 (an idea-1)* You need more time for thought.*3*

You could heartily recommend this workshop to others.*8*

8. When does your Spring term end?
May 22, May 22, May 31

9. Which dates would you prefer for the follow-up sessions (Rank your preference 1,2,3,4,5, or C: I have a conflict.):

May 26-27 *1,1,1,-,1,C,2,-,-*

May 31-June 1 *2,C,2,-,2,C,5,-,-*

June 6-7 *C,4,3,1,C,C,4,-,1*

June 9-10 *C,2,4,2,C,1,3,1,-*

June 13-14 *C,3,5,3,C,2,1,2,-*

ISR

NTER FOR RESEARCH ON UTILIZATION OF SCIENTIFIC KNOWLEDGE / INSTITUTE FOR SOCIAL RESEARCH / THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN 48106

December 22, 1976

Tom Kirk
Science Librarian
Wildman Science Library
Earlham College
Richmond, Indiana 47374

Dear Tom:

Enclosed are the two documents you asked me to prepare: an assessment of the October workshop, and some suggestions about evaluating the impact of the workshop and project. I hope you will find them adequate to your needs. If not, please let me know.

I could use a bit more clarification regarding what role you see me playing between now and the meeting in May/June (and for that matter, at the meeting itself). A few comments in your November 20 report to Joel Goldhar raised this question for me, since based on our previous communications I wasn't aware that anything was in store between the time I submitted these documents to you and the spring meeting.

I hope the other aspects of the project, including the participants' activities, are all going well. Please keep me posted on further developments.

Best wishes, and Happy Holidays!

Sincerely,

Stephen D. Nelson

Stephen D. Nelson
Project Director

SDN/sb

Enc. 2

MEMO TO: Tom Kirk

FROM: Steve Nelson SN/sb

DATE: December 22, 1976

RE: Strategies for assessing the impact of the NSF project on "Course-related Library and Literature Use Instruction in Undergraduate Science Education"

This is an attempt to describe somewhat more fully the model which was rather hastily put together during the workshop of October 19-22 and which you have copies of already. This model (Figure 1) is simply a framework which encompasses (and within which can be fitted) potential ways of evaluating both (a) each institutional team's own back-home efforts, and (b) the workshop and the project as a whole. My intention in this memo is to outline some of the parameters of the evaluation task and to delineate in a general fashion the alternative ways one could proceed with evaluation activities. At the risk of belaboring the obvious, let me spell out some of the considerations that led to this figure.

The major lines of impact of the workshop are upon first the teacher-librarian team working together, and then, hopefully, their impact in turn upon students in the library-oriented course(s) which are the interim project of the team. In the figure these major lines of impact are indicated by the heavy arrows. The teacher-librarian team is drawn in such a way to indicate that both the faculty member (F) and the librarian (L) are organizationally housed in different units of the university--the faculty member within an academic teaching department, and the librarian within the college or university system--but are functionally related as a team for purposes of their joint project.

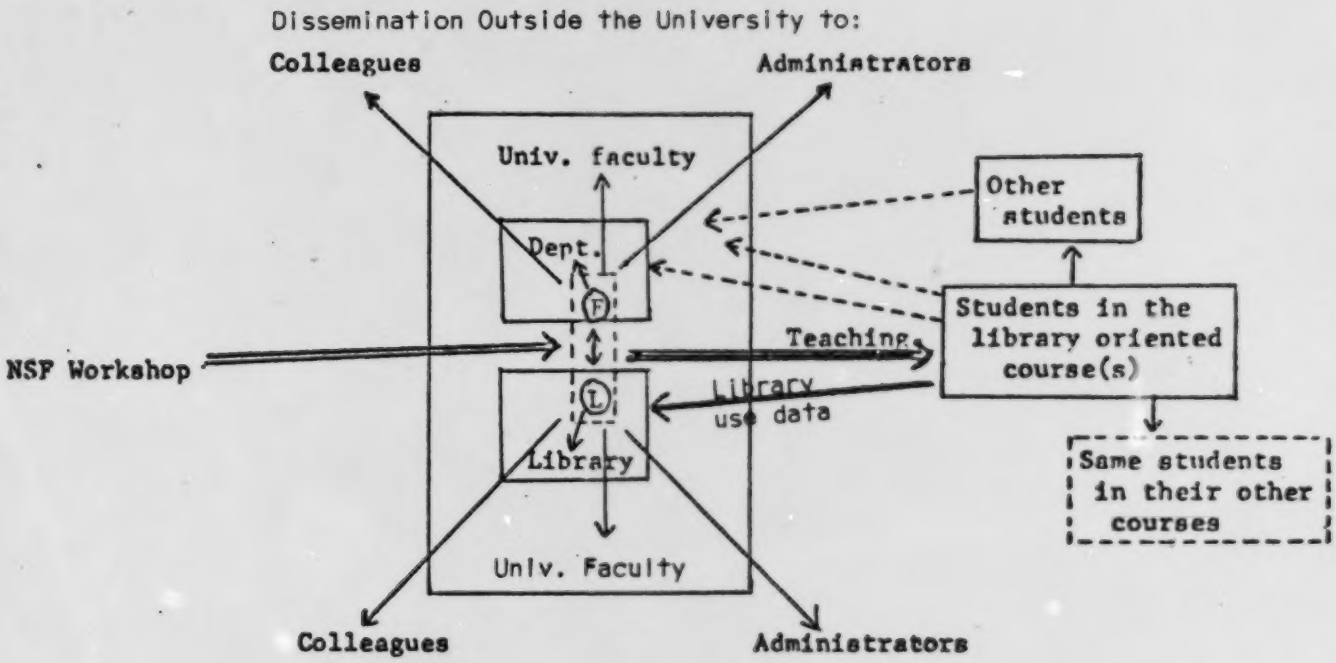


FIGURE I

This portion the impact of the workshop--namely, at the level of each team's project--is, for evaluation purposes, perfectly analogous to the kinds of evaluation studies you have already performed at Earlham regarding your own program of course-related library instruction. The kinds of data one would collect and the sources of those data are similar to what you are already familiar with. The figure above merely illustrates the many types of data that one could conceivably collect in evaluating this part of the model.

I mentioned in the notes accompanying my earlier sketch that each point (or box) and each connecting arrow is the locus of potential data. For example, from the faculty member and librarian one could collect information regarding their interaction and their feelings about working together in this fashion, their subjective estimates of the success of their project, their feelings about the balance of rewards vs. costs in trying such a project, and so forth. As for the "Teaching" arrow from the team to the students, here one would want to know about the nature of the instructional activities and materials used in the course, and so forth. From the students themselves one could collect such information as their perception of the effectiveness of the instruction, their estimates of their library skills, self-reports of their library use patterns, etc. And finally, as indicated by the arrow, one may collect actual library use data (as you have done at Earlham).

An additional type of data that does not appear in this model (and with which you are familiar) is samples of the students' work (the quality of the work itself, quality of the accompanying bibliographies, etc.) An extension of this idea would be to compare, within the same courses and one or more semesters after the library-use instruction project, the performance of students who had previously received library use instruction, with a sample (matched for previous grade-point average) of those who had not received it. This would be a test of the "staying power" of the benefits from such instruction.

Still another question not illustrated by the model is the effects of each team member's involvement in the course-related library instruction upon other aspects of their professional functioning. For example, in the case of the faculty member, does his/her involvement in this project carry over in any way to his/her teaching of other classes? What effect, if any, does it have upon his/her research activities? Upon other professional activities? What is the nature of these effects or carryovers--are they relatively specific skills and behaviors, or instead more diffuse ideas or concepts regarding teaching or literature use? Similar questions may be addressed in the case of the librarian member.

One question that particularly interests Dave Lingwood and me in our project in this area is, what is the nature of both the supports and the barriers that exist on the campus to the team's attempts to institute and then teach such courses? What strategies does one have to adopt in order to capitalize on the supports and/or to overcome or avoid the barriers? The relevance of this for the task of evaluation is that it tells you something about the odds that have to be overcome in order to have an impact at all.

Again, at the risk of stating the obvious, at each point in the figure several different generic types of data may be sought: for example, perceptions, expectations, subjective evaluations, attitudes, behaviors, etc. In general, behavioral data will be the most desirable, although they have their own problems of measurement. Behavioral data may be collected in at least three different ways: (a) "live" observations of time-sampled behavior;

(b) behavioral artifacts (e.g., many of the library use measures are of this nature); and (c) self-reports of behavior by the various actors. For a particularly important concept you may want to get as many different measures of the concept as is feasible, so as to be able to get (hopefully) mutually confirmatory findings regarding the concept, from data of different types.

Beyond this level of evaluation, one can inquire about the impact of the team's project in terms of the spread of effects beyond the bounds of the course(s) designed by the team. Here the remainder of the figure comes into play. Taking the righthand side first, the effects may spread via the students in several different ways. First and most obvious, the students' experiences in the library-oriented courses are likely to affect their work habits and performance in their other courses. Second, there may be a spread of effects to other students as well, as the word about the new type of class filters through the campus grapevine, and other students begin to see the evidence of the first students' new skills and command over their information environment. And third, there may even be some spread of effects from students to other faculty members, especially if the students' new skills carry over into their other coursework.

Alternatively, the spread of effects may be by way of the faculty and/or librarians, to their colleagues either in their own department (or within the library system) or elsewhere in the university. One can expect the usual range of interest and enthusiasm on the one hand, to skepticism and opposition on the other. The spread of effects will probably be enhanced to the degree that one can provide one's colleagues with objective documentation of the

positive effects of course-related library use instruction.

At still another level of analysis, one can try to document the diffusion and dissemination of the concept (of course-related library use instruction) from one university to another. This would be a test of the long-range effects of the workshop and project. However, it is difficult to do completely and well. Tracing the diffusion from the initial set of teams outward usually does not yield a complete picture, because they may not remember--or may not even be aware of--all of those to whom they communicated or demonstrated the concept. On the other hand, one might start at the other end with all identified users and try to trace the diffusion backwards by asking them from whom they learned of the concept. However, this too is unlikely to yield a complete picture because no good mechanism exists for identifying all current users at any given point in time. However, this general type of study would be feasible and would be valuable in tracing the long-range impact of the project. (Incidentally, in this kind of study, you'll know the project has been a great success when--and if--the users become so numerous and widespread that the tracing becomes totally unmanageable.)

Obviously, as the figure and this discussion indicate, there are many more options in the ways one could conceivably evaluate the impact of the workshop and participants' projects, than you have time, energy, or resources for. Consequently, some selectivity is required. Your choices as to what measures should be used in evaluation will depend less on technical issues than on the kinds of political, psychological, and economic considerations stressed by Dick Johnson in his presentation at the workshop--issues such as

your major goals for the project and for the evaluation itself (both the obvious and the nonobvious), who the key audiences will be, trade-offs between project resources and quality of data, etc. Similarly, the question of when to evaluate, and how many times, also depends on such issues.

These issues are probably resolvable in the fairly near future for the first two levels of analysis described above (i.e., each team's project itself, and its spread of effects within the college or university). However, decisions about the other level of analysis (i.e., diffusion of the concept between universities) probably cannot be made until after the second meeting in May or June, 1977, according to the present project design which calls for the participants to assist you in planning for further development and dissemination of the concept of course-related library use instruction.

I hope this rather general account of the evaluation alternatives is helpful. The next step as I see it involves your decisions regarding which particular directions you would like to pursue. Please let me know how I can be of further assistance.

AN ASSESSMENT OF
A WORKSHOP ON COURSE-RELATED LIBRARY AND LITERATURE USE INSTRUCTION
IN UNDERGRADUATE SCIENCE EDUCATION

Held at Earlham College, Richmond, Indiana

October 19-22, 1976

As part of a grant from

The Division of Science Information, National Science Foundation

Principal Investigator: Thomas G. Kirk, Jr., Science Librarian

Wildman Science Library, Earlham College

Stephen D. Nelson

Center for Research on Utilization of Scientific Knowledge

University of Michigan

Ann Arbor, Michigan

This document is an assessment of a workshop on course-related library and literature use instruction in undergraduate science education, held at Earlham College, Richmond, Indiana, October 19-22, 1976. The workshop was part of a grant from the Division of Science Information of the National Science Foundation. This assessment was made at the request of Thomas G. Kirk, Jr., Principal Investigator of the NSF project, and Science Librarian of the Wildman Science Library at Earlham College. I attended the workshop for all but the Thursday afternoon and Friday morning sessions, and have had the benefit of tape recordings of the former. It should be understood that my own background is that of a scientific researcher and teacher rather than a librarian or information scientist, but this is entirely consistent with the intended aims of the project.

The purpose of the NSF project is to improve the library and literature use skills of undergraduate science students, by encouraging the integration of teaching such skills into the substantive class assignments of ongoing science courses. "Library orientation" exercises, or even separate courses in library and literature use, have not proven sufficiently effective in the past, and Earlham's ten-year experience in integrating the teaching of such skills with coursework has proven the effectiveness of this technique in this particular setting. While committed to the general validity of this principle, the Earlham investigators are well aware of the special features of their institution which have enhanced the success of their venture, and of the need for individual tailoring of such practices to other campus settings should they be adopted elsewhere.

The October workshop was the first major effort to systematically disseminate this model and to help other institutions develop similar programs adapted to their own particular settings. The design involved bringing teams composed of a science educator and a librarian, from four carefully selected academic institutions, to Earlham for (1) a relatively in-depth introduction to the Earlham program, and (2) individual consultation and assistance in developing a particular project or program back home at one's own institution. The conditions for selection included (a) commitment on the part of both participants and their institutions to try the concept of course-related library instruction, (b) to attend both the initial and the spring follow-up workshop sessions and to complete a report based upon one's interim project experiences, and (c) a willingness to assist the Earlham investigators in developing subsequent directions for the overall program. Also figuring in the selection of participants was the desire to have some degree of balance regarding such attributes as area of the country represented, size and type of institution, and discipline or field of science instruction.

The workshop will be assessed by means of four broad dimensions: content, methods, personnel, and physical arrangements and other amenities. Each of these dimensions will in turn be broken into subcategories as appropriate.

CONTENT

1. Amount: The participants were presented with a great deal of information, particularly the first full day (Wednesday), and several commented on the volume of information they were being subjected to. But if there was

actual overload, it appeared to be within tolerable ranges. That is, to the degree that there was more information than participants could easily handle in the workshop itself, it seemed to create the incentive to try to absorb it more fully later, rather than being so much as to dampen their enthusiasm for pursuing it. Overall, I would not be inclined to alter this aspect significantly in future sessions.

2. Level: This refers to a kind of composite of the simplicity/complexity and the familiarity dimensions. The level of content presented was certainly manageable and useful to both teachers and librarians. Although it is to be expected that some of the technical aspects of the presentations would be "old hat" to the librarians, this did not appear to be particularly disconcerting. Nor were these aspects overly complex for the teachers. And certainly the primary message of the workshop--namely, the true integration of library and literature skills into class assignments--was relatively new and valuable to both groups.

3. Value/usefulness of particular segments: Participants appeared to be particularly pleased with the descriptions of the Earlham biology program,* their interaction with Kirk and Jerry Woolpy (biology instructor and another mainstay of the Earlham program), and the sessions devoted to working on their own projects. These segments were at the heart of why they were attending in the first place. By far the weakest aspect was the display of sample materials on library orientation and use from Project LOEX. In between, but still judged relatively useful, were three other activities.

*I do not believe this was due simply to the fact the teachers were predominantly from biologically-related or life-science areas, although this fact no doubt helped. This is discussed more fully in Section I under "Methods."

The role-playing exercise, in which participants performed library exercises designed for the Earlham biology students, was generally acknowledged to have been a good experience, although questions were raised regarding whether it was worth the time invested in it. In fairness, it must be noted that if one is to get the full benefit of this experience, it requires a certain minimum amount of time; otherwise, the experience is considerably diluted. In addition, the handing out of students' papers on the same exercises afterwards was instructive in two ways: (a) it showed the generally high quality work of which students are capable when they have learned how to use the library effectively; and (b) it demonstrated how different people use different search strategies working from the same question and having access to the same materials.

A second intermediate segment, in terms of apparent usefulness to participants, was the Wednesday afternoon presentations by the Earlham librarians and teaching faculty. This may have been due either to the presentations' having dealt with fields different from those represented by the participants, or to the participants becoming tired; but for whatever reason, interest appeared to flag somewhat. (I trust that my own judgments do not color this observation, since I was quite interested in two of these presentations.)

The third segment was one devoted to evaluations of library instruction activities. This segment's intermediate ratings were apparently the result of this issue (evaluation) generally not being one of high priority for a few participants. Several were generous in their praise for Richard Johnson who conducted this session, and were relieved that he discussed the larger

issues concerning evaluation, rather than giving them an esoteric lecture on the technical reasons for why such-and-such kinds of measures are not acceptable. I personally was very impressed by this presentation, and found Johnson not only to be in command of the technical issues, but more impressively, to have an excellent grasp of the meta-issues concerning evaluation generally. Kirk and Woolpy also showed themselves to have a good understanding of the issues and principles of evaluation, if not all of the technical details.

4. Materials: The handouts were voluminous, thorough, and generally excellent. Two minor criticisms might be noted, which are more relevant to the "Methods" section than content per se. It would have been somewhat more helpful to have pre-packaged the materials into the notebooks provided, rather than passing each piece out individually at its particular point in the presentation. Secondly, on those occasions when Kirk spontaneously decided to provide copies of materials not already photocopied, or when participants requested such materials, there was not sufficient other staff available to take such chores off his hands. Although project funds may not have permitted it, ideally it would have been desirable to have another assistant on hand to act as "go-fer," and to take this additional responsibility off the already overburdened coordinator. Neither of these comments, however, should detract from the high quality of the materials provided.

METHODS

1. Design and participant selection: In brief, the major features of the project and workshop design are sound; namely, the two-person team

concept; the requirement of commitment to the basic concept and to continuing involvement in the project; and the provision for evaluation of the various efforts. Regarding the selection of participants, there was a good spread across geographic region, large vs. small schools, etc. And whether by design or just good fortune, the participants got along very well and quickly congealed into a cooperative, mutually supportive, and effective group. It would have been desirable to have had somewhat greater variety in the scientific fields represented (3 of the 4 teams were biologically- or life-science-oriented). However, in this respect the project staff was at the mercy of those applying, and there was very little response from several areas (e.g., physics, chemistry, mathematics, engineering). Despite additional efforts on the staff's part, this imbalance could not be sufficiently overcome. However, whether this imbalance actually hampered the workshop is debatable. Apart from lessening the variety of problems presented for consultation, the only negative aspect (and not a serious one at that) was an occasional tendency for some of the teachers to "talk shop."

2. Preparation before the workshop: This aspect of the workshop planning was particularly noteworthy. The project staff sent the participants an unusually clear and complete set of materials well before the workshop. Included were a tentative schedule, a list of participants, descriptive and explanatory materials by Tom Kirk, background reading materials, and a set of instructions. The last item was very explicit regarding both what they could expect of the workshop, and what would be

expected of them. As a result, an unusually well-prepared group arrived at Earlham ready to work and relatively clear about what would transpire while they were there.

3. Scheduling: This aspect can be further subdivided into three parts: length, sequencing or order, and pacing. (a) Length: The workshop appeared to be a comfortable length, although it could probably be done in two full days without going over into the morning of another day, as the present plan called for. I would recommend retaining the "front end" of the schedule, however, with participants arriving in late afternoon. The evening's social events and light orientation activities were particularly effective in getting the group off to a good start. (b) Sequencing or order: Particular activities occurred in a plausible and effective sequence, generally building upon each other toward the goal of the session: in-depth and individualized consideration of each team's projects. Even those activities judged intermediate in usefulness (discussed earlier) were not so uninteresting or non-useful as to put a brake on the workshop's momentum, and the one segment that was negatively evaluated by participants (the Project LOEX display) was optional and thus avoidable by those who were not interested. (c) Pacing: In this regard, perhaps the only uncomfortable portion of the workshop was the first full day when participants were inundated with more information than they knew what to do with. However, as suggested earlier, this was of such an order that the effect was to leave them challenged and enthusiastic, rather than antagonized and grumbling. It must be acknowledged that there is probably a very fine line between the two, and with a less congenial or more contentious group it

could conceivably have gone another direction. I suspect, however, that for most groups, the pacing is within acceptable bounds.

4. Process flexibility: In addition to "building in" a variety of activity types, the project staff maintained considerable flexibility regarding specific activities. On several occasions when unusual opportunities presented themselves, or when participants requested a plausible change in the schedule, changes were made and with good effect. (This flexibility was not without direction and purpose, however, and not all suggested changes were acceded to.) Three specific illustrations will suffice. (a) When the participants were combing the library during the role-playing exercise, one of Jerry Woolpy's students came to him with a question regarding a similar assignment he had been working on. With the student's permission, Jerry arranged for their interaction over this question to take place in front of the group when it reconvened a short time later. This was an enlightening experience for the group, illustrating the student's progress and relative success (despite his uncertainty of himself), as well as Jerry's style of interaction with students and his effectiveness as a teacher. (b) When it became known that in addition to coordinating the workshop Tom Kirk was scheduled to give a literature orientation presentation to an astronomy class one morning, the participants persuaded him to let them visit the class and observe. (c) The original plan had called for individual and "private" discussions by each team with Kirk and Woolpy on Thursday afternoon regarding their projects. However, the participants expressed considerable interest in hearing about others' projects as well and requested what became the "fish bowl" session of that afternoon. In

summary, the project staff were sensitive and responsive to participants' needs, while keeping the general flow of activities on target toward the goal of individual consultation.

5. Future activities: Once again, expectations were clearly set for the nature of interim activities and participants' responsibilities prior to the second meeting in May or June of 1977. In this regard the strategy of building participants in not only as evaluators of their own interim projects but also as "long-range advisors" regarding future developments of the project is particularly effective, in that it gives them an additional stake in the success of the entire effort.

PERSONNEL

Much of the assessment of the project staff lies in the preceding material. As an overall comment, however, I would rate all the major project personnel at least good to (in some cases) excellent in the key areas: level of expertise or knowledge, adequacy of preparation, communicative skills, and interpersonal process skills. The only reservation regarding project staff is the one mentioned earlier regarding the number of staff available during the workshop: to repeat, it would have been helpful to have had another person to take care of some of the nuts-and-bolts concerns.

PHYSICAL ARRANGEMENTS AND OTHER AMENITIES

Regarding the main meeting room. the feelings on the part of some that it was somewhat too small may have stemmed as much from the amount of time spent in the room as from its physical dimensions or characteristics per se.

Its location (right in the library, with materials and facilities at hand) is either essential or at least desirable for several of the activities, so moving the main meeting place to another room (unless nearby) would entail other problems. Perhaps activities for which library facilities are not needed could be held in a somewhat larger but nearby room, to add more variety and lessen the feeling that the walls were closing in.

Facilities for, and the quality of, meals were quite pleasant, as reflected explicitly in the participants' evaluation ratings.

As for lodging, the view was expressed that the Yokefellow Institute was too far from campus, and indeed its distance from the main activities on campus did require special arrangements to be made by the project staff, and was somewhat inconvenient for particpants in that they were restricted in their coming and going and usually had to schedule arrivals and departures to coincide with the availability of the school's van. On the other hand, both the general ambience and specific characteristics of the Institute contributed to developing the group socially and in building a sense of community. The specific characteristics include (a) the sharing of rooms by participants, (b) the absence of locks on the room doors unless requested, (c) the community-style arrangements for meals, and (d) the opportunity to gather in the evening and to chat over popcorn or to play pingpong. This provides a vivid contrast to the more typical conference arrangements with (a) individual rooms in conventional hotels, (b) meals in conventional restaurants, and (c) a generally atomized sense on the part of participants. The project staff should weigh the relative costs and benefits carefully in deciding on arrangements for

lodging for future workshops.

SUMMARY

On the whole the workshop was unusually well organized and conducted. The qualifications noted in each of the above sections are relatively minor. It is difficult to say how large a role the positive "personal chemistry" and fit among participants played in the overall success of the workshop; but irrespective of this, it should be emphasized that in nearly every major respect the careful planning and execution by the project staff contributed to a remarkably effective workshop.

MEMORANDUM

Earlham College
Richmond, Indiana

TO: Tom Kirk

FROM: Jerry Bakker

DATE: December 17, 1976

Here are some brief comments on the October library workshop.

The schedule was a bit tight. The participants worked hard, but would probably have been a little better off with a schedule not so full.

The mix of participants worked exceptionally well. My guess is that this can be traced to the fact that the pairs of people from each institution really wanted to learn about bibliographic instruction.

It would probably have been better had the reports on each team's work been given to Jerry and you rather than to the whole group. Given the circumstances I think you did the best thing, but a private conversation with you and Jerry would have been more productive.

As we discussed in the meeting of you, Woolpy and me, some follow-up with the participants by telephone or visit should take place periodically during the next few months.

To facilitate better planning by the participants of their work, they should be asked to provide the following:

Statement of Goals	(general reasons for involvement in workshop)
Statement of Objectives	(Specific listing of what is to be done back on home campuses)
Means of Accomplishment	(For each objective, specific details on who will do what and when)
Means of Assessment	(Details on how materials and programs are used and evaluated)

We should probably talk about how to describe this planning process and whether parts of it may yet be used with this year's group. However, we agree that the participants' plans were too vague and this may be a way to get substance there. We could ask for the June reports to follow a set pattern designed to fit this form. The next group of participants need to be encouraged early to get specific on their plans.

NSF Spring Workshop 5/26/77
Report on evaluation session
Submitted by Jerry Bakker

It is worth noting again that the persons who participated in this workshop have been an extraordinarily congenial and effective group. There was nothing in their vitas or the first impressions received of the individuals which would have led me to predict this. One could, therefore, argue that the purpose and design of the workshop worked some magic, but there remains the possibility of some fortuitous personal factors operating. Until something better comes along, however, I will assume that the workshop subject, the staff, and the way things were done, all together made for a very successful experience for the participants.

1. Fall Workshop--All agreed that the critique-in-a-fishbowl worked last October. I would suggest, however, that time for private critique sessions be reserved.

Opinion was divided on the value of the inclusion of the non-science people last fall. All said that the presentations were worthwhile, but some felt that if time was needed for other things, the descriptions of non-scientific bibliographic instruction should be cut back. Dick Johnson's comments on evaluation were highly regarded.

All felt that the time allotted to the home teams to work on their own plans was incaluable. A problem common to all institutions and only partly anticipated was the difficulty of getting home teams together back at their own campuses. They appreciated the time during the fall workshop and should be warned of the need to set aside time in advance when back on home campuses.

There should be greater clarity on how they are organized for working through the Earlham Biology instruction.

2. Problems not anticipated:

Kirk and Woolpy did too good a job of selling the Earlham program and led them to set their sights too high trying to follow the Earlham model.

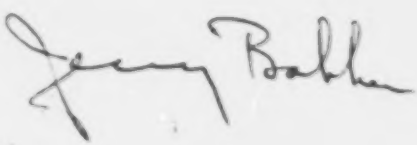
Not enough class time was allotted.

Some didn't realize how institution-specific their project had to be.

3. Common problems:

Difficulty in getting other faculty interested.
Physical problems of preparing large numbers of handouts.
Little recognition of the amount of preparation time required.
Difficulty in finding time for home teams to work together.

The persons in my group were enthusiastic about their experiences at Earlham and what they had done back home. They are all prepared to go back and do more of what they have started.



SR

TER FOR RESEARCH ON UTILIZATION OF SCIENTIFIC KNOWLEDGE / INSTITUTE FOR SOCIAL RESEARCH / THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN 48106

MEMO TO: Tom Kirk

FROM: Steve Nelson

DATE: June 6, 1977

RE: An account of the discussion (by half of the participants) during the evaluation session of the NSF Spring Workshop

The following is a summary of the major points that arose during the evaluation session at the end of the Spring Workshop. My group devoted approximately equal time to the three questions, and the comments below are organized around them.

1. "Given your recent experiences how should the Fall Workshop be revised?" Generally there was strong endorsement of both the general design and many of the specific features of the Fall Workshop. They still feel it was very successful. Specifically, they liked the overall design (information overload, followed by team problem-solving, followed by the fishbowl), and felt strongly that the fishbowl feature should be built in for the next group. Other features that emerged as particularly desirable or valuable were the small size (4-5 groups at most) and the opportunity to visit classes in which you were giving library instruction. One person commented that the next group should see you do the Astronomy lecture that we only fortuitously were able to witness.

The major recommendation for revision concerned the participants' need for more how-to-do-it "nitty-gritty" on evaluating their own programs back home. While they apparently are sensitive to the major issues of evaluation,

they apparently would have liked something more immediately helpful in the way of tools, guidelines, and so forth. Two other issues produced less consensus while also raising questions about possible revisions. There was difference of opinion regarding proposed plans to drop the Psychology and Political Science presentations in favor of other offerings, some people having found that at least interesting if not valuable. Also, although no one actually questioned the desirability, from NSF's or your viewpoints, of having a good spread of teams across scientific disciplines, two people commented that with the concentration in biologically-related areas, they at least felt "comfortable" and "had someone to talk to."

2. "List the problems of implementing your program which you did not anticipate." The major issue mentioned here was that of coordination between the instructor and the librarian, especially with regard to striking an appropriate balance between such dichotomies as (a) highly structured instruction vs. letting students experiment, and (b) providing great amounts of information vs. letting students ask for it as they need it. These issues were seen as problems, since the appropriate balance depends on the age and experience of the students, the number of students in the class, the quality of students, etc., and thus must vary for each class.

In general, participants felt that the Fall Workshop had prepared them quite well for what they faced back home. Someone expressed the view that even though one can anticipate the major problems one will face, actually living through them and working them out in practice is quite another matter.

3. "List the problems of implementation which seem common to more than one of the institutions." The major theme, and one that drew strong consensus, was that the principle factor in the success of the Workshop is its being conducted at Earlham by Earlham people. The initial and primary hurdle is what one person called "brainwashing"--making the participants believe that such a program can work, and then showing them how to do it. The major factor in successfully doing this, they felt, was the fact that it takes place at Earlham, where participants are out of their own environment, can get a feel for the (usually) quite different environment of Earlham, and can see how the staff work "on their own turf." We have mentioned repeatedly the unusual nature of Earlham as an institution and how this facilitates the program of course-related library instruction (for example, the fact that it is small, community-oriented, supportive, and without the cut-throat competition that characterizes many other institutions). But equally important in the participants' view was the nature of specific faculty, namely, Kirk, Woolpy, and Bakker. They felt that they were able to get out of their own environment and see a group of faculty operating with a different set of goals and motivations--not a career-building drive for publications and research grants, but a real and visible dedication to teaching students and helping them learn. One viewpoint that was expressed was that this was highly conducive to identifying potential problems of implementation back home not because Kirk or Woolpy tells them, "Here are the things you'll have to watch out for," but because by contrasting their back-home situation with what they see at Earlham, they can begin to identify potential pitfalls that require planning.

On the other hand, participants did believe strongly that the program is "exportable" to other settings, but that the exporting is probably best done by teams like themselves returning from Earlham, rather than Kirk, Woolpy, et. al. "taking their show on the road." And once successfully implemented by them back home, further dissemination of the program will result not from their proselytising for it, but from the visible products of their success, namely, capable students and the quality of their work.

In addition to the above questions, I inquired directly (after assuring them of anonymity) about their assessments of the staff's (primarily Kirk and Woolpy) ability to provide constructive critical input. It was the unanimous feeling of the group, as well as my independent judgment, that this was a very strong point on the part of the staff. As one participant put it, it was "terriffic!," to vigorous head-nodding all around.

Guidelines For Report on Activity

The following information should be provided, and/or documents supplied as parts of the report on your NSF project:

1. Institutional and library context
   A. Personnel involved in the project, their curriculum vitae
   B. Description of course or courses in which library and literature use instruction was involved (more than a catalog statement)
   C. A copy of the library's handbook and/or a description of the library's collection and facilities
   D. Number of students in course(s) listed in B. Students' class standing: freshmen, sophomore, junior, senior.
2. "Instructional unit"
   A. Objectives of your library and literature use instruction
   B. Materials produced
   C. An outline of any oral instruction
   D. Copy of assignments as given to students;
3. Student results
   A. Copies of some of the best and worst of the completed assignments;
4. Reviews
   A. Any evaluation forms used
   B. Evaluation results
   C. Personal critique
   D. Proposals for revision of your project;
5. What things should the October workshop have covered that it didn't?

NSF Workshop

Spring, 1977

Earlham College
Richmond, IN

AGENDA

Wednesday, May 25		Arrival
	5:30	Dinner, Jones House
	7:30	Social Occasion, Kirk's
Thursday, May 26	7:45 AM	Breakfast
	8:30-10:00	Read reports
	10:00-10:15	Break
	10:15-11:15	St. Olaf
	11:15-12:15	Univ. of Arizona
	12:30-1:30	Lunch, Jones House
	1:45-2:45	Johns Hopkins
	2:45-3:45	Oregon State
	3:45-4:00	Break
	4:00-5:00	Assessment of Project
	5:00	Adjournment

NSF Spring Workshop

May 26, 1977

Evaluation Discussion

1. Given your recent experiences how should the Fall Workshop be revised?

2. List the problems of implimenting your program which you did not anticipate?

3. List the problems of implimentation which seem common to more than one of the institutions.

Inventory of Key People

Please complete as many spaces as possible. For additional names use back of sheet.

Name of Institution_____

Institution Address_____

1. Librarian's Supervisor _____ Name

_____ Title

_____ Adress

2. Immediate Library Associates:

_____ _____

_____ _____

_____ _____

3. Department Chairperson: _____

_____

_____

4. Department Colleagues: _____ _____

_____ _____

_____ _____

5. Administrators outside the department or specific library unit (e.g. Deans, Assit. Director for Public Services, Library Director, vice-President for Academic Affairs).

_____ _____ _____

_____ _____ _____

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5. Other Key Persons: